Chapter 13
Water

Contents

13. Water

13.1 Introduction

This Chapter of the Environmental Impact Assessment Report (EIAR) assesses the impact of the Blanchardstown to City Centre Core Bus Corridor Scheme (hereafter referred to as the Proposed Scheme), on the surface water environment during the Construction and Operational Phases. The following attributes of each surface water body (receptor) are considered: hydrology, hydromorphology and water quality. Hydrogeology is dealt with specifically in Chapter 14 Land, Soils, Geology and Hydrogeology.

During the Construction Phase, the potential surface water impacts associated with the development of the Proposed Scheme have been assessed, including potential impacts from construction runoff and watercourse disturbance due to utility diversions, road resurfacing and road realignments.

During the Operational Phase, the potential surface water impacts associated with changes in surface water runoff, increased hardstanding and watercourse disturbance have been assessed.

The assessment has been carried out according to best practice and guidelines relating to surface water assessment, and in the context of similar large-scale infrastructure projects.

An assessment of Proposed Scheme compliance with the Water Framework Directive (WFD) (Directive 2000/60/EC) requirements is provided in Appendix A13.1 WFD Assessment in Volume 4 of this EIAR; the status of WFD water bodies and protected areas within the Study Area are provided in Section 13.3 and a summary of the conclusions of the WFD assessment is provided in Section 13.6.3.

Flooding has been assessed within a Site Specific Flood Risk Assessment (FRA) report in Appendix A13.2 in Volume 4 of this EIAR. The results of this assessment have been summarised in Sections 13.3.10 and 13.4.7 of this Chapter.

The aim of the Proposed Scheme when in operation is to provide enhanced walking, cycling and bus infrastructure on this key access corridor in the Dublin region, which will enable and deliver efficient, safe, and integrated sustainable transport movement along the corridor. The objectives of the Proposed Scheme are described in Chapter 1 (Introduction). The Proposed Scheme which is described in Chapter 4 (Proposed Scheme Description) has been designed to meet these objectives.

The design of the Proposed Scheme has evolved through comprehensive design iteration, with particular emphasis on minimising the potential for environmental impacts, where practicable, whilst ensuring the objectives of the Proposed Scheme are attained. In addition, feedback received from the comprehensive consultation programme undertaken throughout the option selection and design development process have been incorporated, where appropriate.

13.2 Methodology

13.2.1 Study Area

The baseline study area for this assessment is 500m from the boundary of the Proposed Scheme, It is anticipated that any likely significant impacts from the Proposed Scheme would occur at local water bodies, and given the nature and extent of the Proposed Scheme, the 500m study area is considered appropriate to encompass all those water bodies that may be susceptible to significant impacts. Therefore, any identified surface water bodies within that area have been considered as receptors including those classified under the Water Framework Directive (WFD)), including riverine, transitional water bodies, lake (water) bodies and coastal water bodies, and also non-WFD classified water bodies. Artificial drainage features such as existing Sustainable Urban Drainage Systems (SuDS) have not been considered as receptors within the baseline assessment.

The nearest surface water abstraction point is Leixlip Reservoir, more than 8km upstream of the Proposed Scheme. This is a major public water supply abstraction point (approximately 195,000 m3/day (cubic meters per day)) which supplies approximately 600,000 people, serving Fingal, Kildare and North Dublin. However, due to separation from the Proposed Scheme and the fact that it is upstream of the study area, there is considered to be no potential for the Proposed Scheme to interact with this abstraction point and, accordingly, this abstraction point has not been considered further in the assessment.

13.2.2 Relevant Guidelines, Policy and Legislation

13.2.2.1 Water Framework Directive (WFD)

The WFD established a framework for the protection of both surface water bodies and groundwaters. The WFD provides a vehicle for establishing a system to improve and / or maintain the quality of water bodies across the European Union. The Directive requires all water bodies (rivers, lakes, groundwater, transitional, coastal) to attain 'Good Water Status' (qualitative and quantitative) by 2027.

There are a number of objectives under which the quality of water is protected. The key objectives at EU level are the general protection of the aquatic ecology, specific protection of unique and valuable habitats, the protection of drinking water resources, and the protection of bathing water. The objective is to achieve this through a system of river basin management planning and extensive monitoring. 'Good Status' means both 'Good Ecological Status' and 'Good Chemical Status'.

The WFD was initially transposed into Irish law in by S.I. No. 722/2003 – European Communities (Water Policy) Regulations 2003, as amended (hereafter referred to as the Water Policy Regulations). The Water Policy Regulations outline the water protection and water management measures required to maintain high status of waters where it exists, prevent any deterioration in existing water status and achieve at least Good Status for all waters.

Subsequently, S.I. No. 272/2009 - European Communities Environmental Objectives (Surface Waters) Regulations 2009, as amended, (hereafter referred to as the Surface Waters Regulations and S.I. No. 9/2010 - European Communities Environmental Objectives (Groundwater) Regulations 2010, as amended, (hereafter referred to as the Groundwater Regulations) were promulgated to regulate WFD characterisation, monitoring and status assessment programmes in terms of assigning responsibilities for the monitoring of different water categories, determining the quality elements and undertaking the characterisation and classification assessments.

The Water Policy Regulations require the assessment of permanent impacts of a scheme / project on WFD water bodies, (rivers, lakes, estuaries, coastal waters and groundwater). Typically, the permanent impacts include all operational impacts, but can also include impacts from construction depending on the programme (i.e., length and / or nature of the works etc.) of a scheme / project as some potential construction impacts could be considered permanent in the absence of mitigation. An assessment of the compliance of the Proposed Scheme with WFD requirements is provided in Appendix A13.1 WFD Assessment; a statement of the status of WFD water bodies and protected areas within the Study Area are provided in Section 13.3 and a summary of the conclusions of the WFD assessment is provided in Section 13.6.3.

In the absence of WFD assessment guidance specific to Ireland, the assessment has been carried out using the UK Environment Agency's 'Water Framework Directive assessment: Estuarine and Coastal waters' 2016 (updated 2017) (Environment Agency 2016). No specific guidance exists for freshwater water bodies, however this guidance was used as the basis of the UK's Planning Inspectorate (PINS) Advisory Note 18 'Water Framework Directive' June 2017 (PINS 2017) in which it sets out the stages of an assessment. On this basis it is considered appropriate to use for the assessment of the Proposed Scheme.

13.2.2.2 River Basin Management Plans

River Basin Management Plans (RBMPs) provide the mechanism for implementing an integrated approach to the protection, improvement and sustainable management of the water environment, and are published every six years.

The second cycle RBMP 2018 - 2021 was published by the Department of Housing, Planning and Local Government (DHPLG) in April 2018 and covers Ireland as a whole (DHPLG 2018). For the second cycle, the Eastern, South-Eastern, South-Western, Western and Shannon River Basin Districts have been merged to form one national River Basin District (RBD). For 'At Risk' water bodies, the RBMP 2018 - 2021 identified the frequency of significant pressures as follows: agriculture (53%), hydromorphology (24%), urban wastewater (20%), forestry (16%), domestic wastewater (11%), urban runoff (9%), peat (8%), extractive industry (7%) and mines and quarries (6%).

In September 2021, the Minister for Housing, Local Government and Heritage, published the draft River Basin Management Plan for Ireland 2022-2027 for public consultation (DHLGH 2021). The consultation period closed in March 2022. The draft RBMP sets out at the outset that it is published in the context of a rapidly changing policy landscape at European and International levels and against a backdrop of 'widespread, rapid and intensifying climate change'. In addition, Ireland is now experiencing a sustained decline in water quality following many years of improvements, therefore stronger measures are now required to achieve sustainable water management in order to address and adapt to the impacts of climate change and achieve the desired outcomes for biodiversity.

Image 13.1 presents the ecological status of water bodies in Ireland over the past two cycles of the RBMP and illustrates the reduction in water quality, particularly in relation to the reduced percentage of water bodies achieving high status and increased percentage achieving bad status. The reductions in water quality are especially notable for rivers; for other water bodies the changes are more mixed; some reductions, some improvements. The draft RBMP cites a 4.4% net decline in the status of water bodies, and notes that this is mostly driven by a decline in the status of river water bodies.

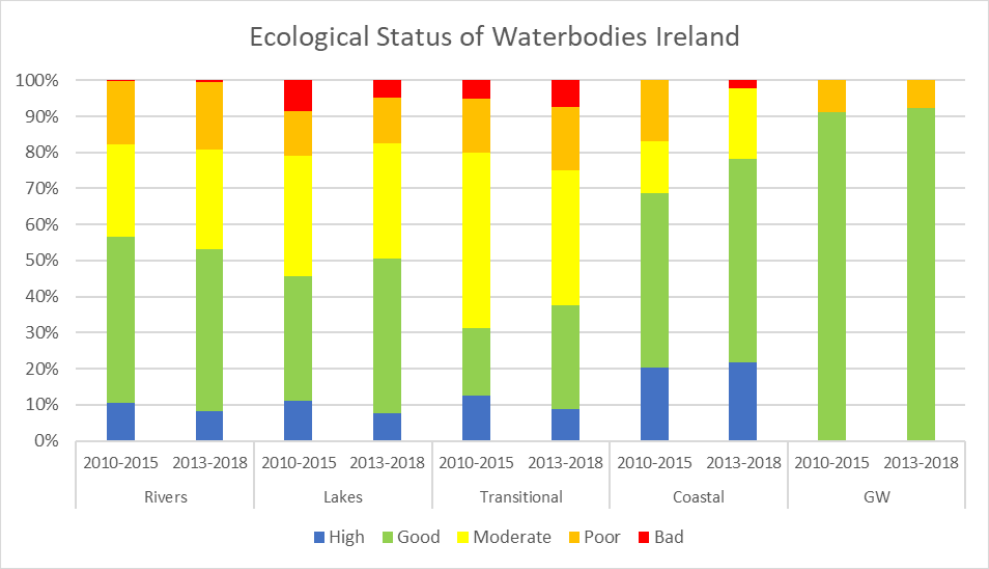

Image 13.1: Ecological Status of Water bodies in Ireland

The characterisation and risk assessments carried out for the third cycle show that 33% of water bodies are At risk of not meeting their environmental objective of good or high status. Of these, 46% are impacted by a single significant pressure. Agriculture remains the most common pressure, followed by hydromorphology, forestry and urban wastewater. There has been an increase in water bodies impacted by agriculture since the second cycle RBMP.

The draft RBMP sets out a Programme of Measures (PoMs) necessary to deliver the objectives of the WFD in full and to contribute to other environmental priorities.

13.2.2.3 Guidelines

The following guidance detailed in Table 13.1 has also been consulted during the preparation of this Chapter, where relevant.

Table 13.1: Guidelines

EIA Topic	Guidance
EIA / General	• Environmental Protection Agency (EPA), Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (hereafter referred to as the EPA Guidelines) (EPA 2022); and, • European Commission (EU) Environmental Impact Assessment of Projects. Guidance on the Preparation of the Environmental Impact Assessment Report, 2017. (EU, 2017)
Water	• Transport Infrastructure Ireland (TII) Road Drainage and the Water Environment guidance document (TII 2015). • National Road Authority (NRA) Guidelines for the Crossing of Watercourses During the Construction of National Road Schemes (NRA 2005)*; • Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (hereafter referred to as the TII Assessment Guidelines) (NRA 2008)*; and • The Department of the Environment, Heritage and Local Government (DEHLG) and the Office of Public Works (OPW) Planning System and Flood Risk Management Guidelines for Planning Authorities (hereafter referred to as the FRM Guidelines) (DEHLG and OPW 2009).

** The NRA and Rail Procurement Agency merged to establish a new agency – Transport Infrastructure Ireland (TII). As a result, all previous NRA documents are now referred to as TII documents*

13.2.3 Data Collection and Collation

Information on the baseline environment including hydrology, hydromorphology and water quality of the receptors within the study area has been collected and collated by undertaking both a desk study and field surveys.

13.2.3.1 Data Sources used to Undertake Desk Study

Table 13.2 details the data sources consulted during the assessment.

Table 13.2: Data Sources used to Undertake Desk Study

Assessment Attribute	Title
General	• Ordnance Survey of Ireland (OSI) - current and historic mapping; and • Aerial photographs (i.e., Google Maps).
Surface Water Quality and Hydromorphology	• WFD Ireland Database; • EPA (Environmental Protection Agency) - water quality monitoring database and reports. EPA Water Environment Maps (EPA 2020a); • EPA Environmental Data Maps; • National Parks and Wildlife Service (NPWS) - designated sites (NPWS 2020); and • Inland Fisheries Ireland (IFI) - fishery resources.
Hydrology	• Catchment Summaries; • RBMP 2018 - 2021 (DHPLG 2018); • The ERBD RBMP (ERBD 2009), which includes the River Liffey and its associated Water Management Unit Action Plans (various); and, • EPA - flow and water level measurements.
Water / Flood Risk	• OPW National Flood Information Portal (OPW 2020) (Floodmaps.ie).

13.2.3.2 Field Surveys

Field surveys were carried out in March 2020. All watercourse crossings within the study area were visited to inform the determination of baseline conditions in order to identify the likely impacts of the Proposed Scheme.

There was one survey location for the Liffey Estuary Upper in the study area for the Proposed Scheme. There were two survey locations for the Tolka_040 within the study area. There was one survey location for the Royal Canal within this study area. These water bodies were prioritised for survey because of their proximity to higher risk construction activities (structures and compounds).

Water quality sampling data was obtained from the EPA's water quality monitoring programme. Specifically, all culvert and bridge crossing locations and fluvial flood inundation extents were visited. Observations were made from bridges and from the top of riverbanks. The following observations were recorded at each survey location:

- Flow conditions (recording observations such as homogenous flow, low flow or high flow);
- Riverbed (recording observations such as the sediment type and whether there was any deposition);
- Water quality (recording any potential sources of pollution as well as visual indicators of poor quality (e.g., presence of sewage fungus, litter or foam lines);
- Bank stability (recording any instances of erosion and aggradation);
- Natural and manmade features of the river (including modifications, examples of structures could include culverts, weirs or bridges);
- Runoff pathway and risk (recording the pathway for any surface runoff to the watercourse and the likelihood of surface runoff reaching the river);
- Riparian vegetation (recording the surrounding vegetation); and
- Outfalls and discharges (recording any outfalls and discharges and whether these were active at the time of the survey).

Information gathered during the field surveys undertaken in March 2022 is summarised in Section 13.3.4 of this Chapter.

13.2.4 Methodology for the Assessment of Impacts

13.2.4.1 General Approach

The following method for the assessment of impacts has been adapted from the Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (hereafter referred to as the TII Assessment Guidelines) (NRA 2009), specifically Section 5.6. The assessment also took account of the guidance set out in the Environmental Protection Agency (EPA) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (hereafter referred to as the EPA Guidelines) (EPA 2022). In addition, the relevant provisions of the EU's Environmental Impact Assessment of Projects Guidance on the preparation of the Environmental Impact Assessment Report (EU, 2017) have been considered in preparing this chapter of the EIAR.

The surface water environment is intrinsically linked to flood risk, ecological receptors and groundwater, considered in the FRA Report (Appendix A13.2 in Volume 4 of this EIAR), Chapter 12 (Biodiversity) and Chapter 14 (Land, Soils, Geology & Hydrogeology), respectively. Commercial and recreational use of the water environment is not included in the scope of this Chapter, as commercial and recreational interests are considered and assessed in Chapter 19 (Material Assets) and Chapter 10 (Population).

The TII Assessment Guidelines outline how impact type, magnitude, and duration should be considered relative to the importance of the hydrological receptor and its sensitivity to change in order to determine significance of the impacts.

The overall impact on surface water receptors (i.e., rivers, canals, transitional water bodies, coastal water bodies and lakes) as a result of the Proposed Scheme will be determined based on two parameters:

1. The sensitivity of the water body attributes (hydrology, water quality and geomorphology) to change; and
2. The magnitude of the impacts on water body attributes.

13.2.4.2 Sensitivity of Receptors

The sensitivity of surface water attributes to changes as a result of the Proposed Scheme are determined by a set of criteria including their relative importance or 'value' (e.g., whether features are of national, regional or local value). Table 13.3 outlines the criteria for estimating the sensitivity of receptors and their attributes.

Table 13.3: Criteria Used to Evaluate the Sensitivity of Surface Water Receptors (NRA 2009 adapted to include WFD Assessment Guidelines (Environment Agency 2016))

Sensitivity	Criteria	Typical Example
Extremely High	Receptor (or receptor attribute) has a very high quality or value on an international scale	• Any WFD water body which is protected by European Union (EU) legislation (e.g., Designated European Sites (Special Areas of Conservation (SAC) and Special Protection Areas (SPA)) or 'Salmonid Waters'; and • A water body that appears to be in natural equilibrium and exhibits a natural range of morphological features (such as pools and riffles). There is a diverse range of fluvial processes present, free from any modification or anthropogenic influence.
Very High	Receptor (or receptor attribute) has a high quality or value on an international scale or very high quality or value at a national scale	• Any WFD water body (specific EPA segment) which has a direct hydrological connection of <2km to European Sites or protected ecosystems of international status (SAC / SPA or Salmonid Waters); • WFD water body ecosystem protected by national legislation (Natural Heritage Area (NHA) status); • A water body that appears to be largely in natural equilibrium and exhibits a diverse range of morphological features (such as pools and riffles). There is a diverse range of fluvial processes present, with very limited modifications; and • Nutrient Sensitive Areas.
High	Receptor (or receptor attribute) has a moderate value at an international scale or high quality or value on a national scale	• A WFD water body with High or Good WFD Status; • A Moderate WFD Status (2013 - 2018) water body with some hydrological connection (<2km) to European Sites or protected ecosystems of international status (SAC / SPA or Salmonid Waters) further downstream; • WFD water body which has a direct hydrological connection to sites/ecosystems protected by national legislation (NHA status); • A water body that appears to be in some natural equilibrium and exhibits some morphological features (such as pools and riffles). There is a diverse range of fluvial processes present, with very limited signs of modification or other anthropogenic influences; and • Direct hydrological connectivity to Nutrient Sensitive Areas.
Medium	Receptor (or receptor attribute) has some limited value at a national scale	• WFD water body with Moderate WFD Status (2013 - 2018); • WFD water body with limited (>2km <5km) hydrological importance for sensitive or protected ecosystems (much further downstream); • A water body showing signs of modification or culverting, recovering to a natural equilibrium, and exhibiting a limited range of morphological features (such as pools and riffles). The watercourse is one with a limited range of fluvial processes and is affected by modification or other anthropogenic influences; • Evidence of historical channel change through artificial channel straightening and re-profiling; and • Some hydrological connection downstream Nutrient Sensitive Areas.
Low	Receptor (or receptor attribute) has a low quality or value on a local scale	• Water body with Bad to Poor WFD Status (2013 - 2018) • A WFD water body with >5km (or no) hydrological connection to European Sites or national designated sites. Or • A non-WFD water feature with minimal hydrological importance to sensitive or protected ecosystems; and / or economic and social uses; • A highly modified watercourse that has been changed by channel modification, culverting or other anthropogenic pressures. The watercourse exhibits no morphological diversity and has a uniform channel, showing no evidence of active fluvial processes and not likely to be affected by modification. Highly likely to be affected by anthropogenic factors. Heavily engineered or artificially modified and could dry up during summer months; and • Many existing pressures which are adversely affecting biodiversity.

13.2.4.3 Magnitude of Impact

The scale or magnitude of potential impacts (both beneficial and adverse) depends on both the degree and extent to which the Proposed Scheme may impact the surface water receptors during the Construction and Operational Phases.

Factors that have been considered to determine the magnitude of potential impacts include the following (EPA 2022):

- Nature of the impacts;
- Intensity and complexity of the impacts;

- Expected onset, duration, frequency and reversibility of the impacts;
- Cumulation of the impacts with other existing and / or approved projects impacts; and
- Possibility of effectively reducing the impacts.

The criteria for determining the magnitude of impacts is outlined in Table 13.4.

Table 13.4: Criteria for Determining the Magnitude of Impact on Surface Water Receptors (NRA 2009)

Nature of Impact	Description	Scale and Nature of Impacts
High Adverse	Results in loss of attribute and/or quality and integrity of the attribute	▪ Loss or extensive change to a fishery. ▪ Loss of regionally important public water supply. ▪ Loss or extensive change to a designated nature conservation site. ▪ Reduction in water body WFD classification or quality elements. ▪ Results in loss of receptor and/or quality and integrity of receptor. ▪ An impact, which has a high likelihood of occurrence and that has the potential to alter the character of a small part or element of the receptor in the medium-long term. This could be frequent or consistent in occurrence, and result impact which may alter the existing or emerging trends.
Medium Adverse	Results in effect on attribute and/or quality and integrity of the attribute	▪ Partial loss in productivity of a fishery. ▪ Degradation of regionally important public water supply or loss of major commercial/industrial/agricultural supplies. ▪ Contribution to reduction in water body WFD classification. ▪ Results in impact on integrity of receptor or loss of part of receptor. ▪ An impact, which has reasonable likelihood of occurrence and that has the potential to alter the character of a small part or element of the receptor in the medium term. This could be intermittently or occasionally, and result impact which may be consistent with existing or emerging trends.
Low Adverse	Results in some measurable change in attributes, quality or vulnerability	▪ Measurable impact but with no change in overall WFD classification or the status of supporting quality elements. ▪ Minor impacts on water supplies. ▪ Results in minor impact on integrity of receptor or loss of small part of receptor. ▪ An impact, which has low likelihood of occurrence and that has some potential to alter the character of a small part or element of the receptor in the short term. This could be on a once-off occasion or rare occurrence, and result impact which may be consistent with existing or emerging trends.
Negligible	Results in effect on attribute, but of insufficient magnitude to affect the use or integrity	▪ No measurable impact on integrity of the attribute. ▪ Results in an impact on receptor but of insufficient magnitude to affect either use or integrity.
Low Beneficial	Results in some beneficial effect on attribute or a reduced risk of negative effect occurring	Has some potential to results in minor improvement WFD quality element(s)
Medium Beneficial	Results in moderate improvement of attribute quality	Contribution to improvement in water body WFD classification.
High Beneficial	Results in major improvement of attribute quality	Improvement in water body WFD classification.

13.2.4.4 Significance of Impacts

The significance of an impact is determined by combining the sensitivity of the receptor with the predicted magnitude of impact, as shown in Table 13.5.

Table 13.5: Categories of Environmental Impacts

Importance of Attribute	Magnitude of Impact			
	Negligible	Small	Moderate	Large
Extremely High	Imperceptible	Significant	Profound	Profound
Very High	Imperceptible	Significant / Moderate	Profound / Significant	Profound
High	Imperceptible	Moderate / Slight	Significant / Moderate	Profound / Significant
Medium	Imperceptible	Slight	Moderate	Significant
Low	Imperceptible	Imperceptible	Slight	Slight / Moderate

13.2.4.5 Traffic Assessment Method

Traffic modelling (see Chapter 6 (Traffic & Transport)) has been carried out for two scenarios; the Do Minimum and Do Something (i.e. respectively without and with the Proposed Scheme) for 2028 and 2043. In addition to predicting how traffic on the main route of the Proposed Scheme could change, it also includes modelling for predicted traffic on side roads. This allows an understanding of whether the Proposed Scheme could result in increased traffic on those side roads via displacement.

This is important from a surface water perspective because, whilst the main route will continue to discharge to the same catchment as existing, there is the potential for displaced traffic on side roads which discharge to a different water body. This could lead to a change in pollutant loadings and consequent impacts on that water body.

To help determine the level of traffic required to cause a potentially significant impact, TII's guidance document, Road Drainage and the Water Environment (TII 2015) was consulted. It states that roads carrying less than 10,000 Annual Average Daily Traffic (AADT) are lightly trafficked and therefore pollutants occur in lower concentrations. As such, no significant impacts on receptors are considered likely. This figure, therefore, was used as a threshold point to determine whether there was the potential for impacts on water bodies.

The threshold was built into a 'decision tree' approach (see Diagram 13.1) for the assessment of impacts from displaced traffic.

In order to determine which water body the drainage from side roads carrying displaced traffic would discharge to, the Proposed Scheme Catchment Plans were consulted (see Proposed Surface Water Drainage Works (BCIDC-ARP-DNG_RD-0005_XX_00-DR-CD-9001) in Volume 3 of this EIAR).

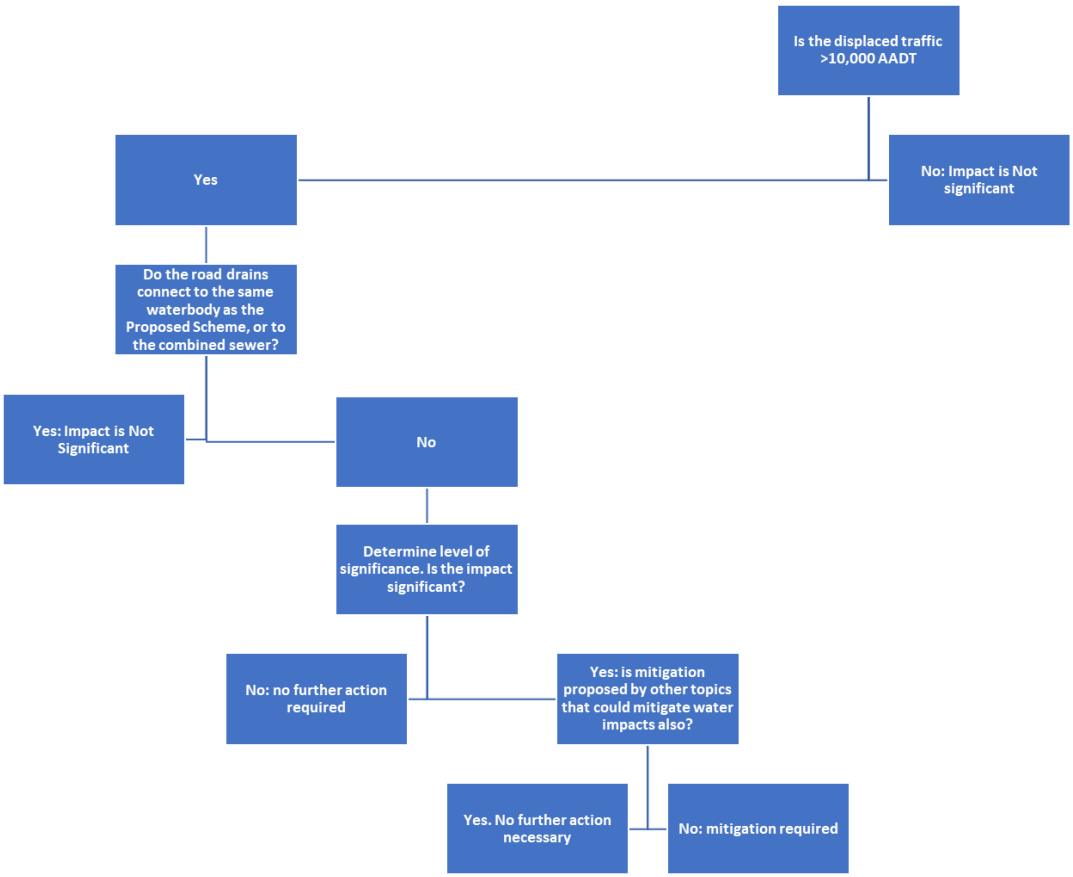

Diagram 13.1 Traffic Assessment Decision Tree

If, through the decision tree, it is determined that a new water body is potentially impacted upon, a qualitative assessment of the potential impact will be carried out. For the sections of road being considered in this assessment, the use of the Highways Agency Risk Assessment Tool (HAWRAT) is not considered appropriate; and it is considered that it would be a disproportionate level of assessment for the scale of the Proposed Scheme. Taking into account the existing urban nature of the roads under consideration, the following criteria are applied to determine the magnitude of impact on the new receptor:

- If road section length <100m, magnitude is negligible;
- If AADT < 10,500 magnitude is small;
- If AADT >10,500 and <11,000 magnitude is medium; and
- If AADT >11,000, the HAWRAT spreadsheet will be used to check for potential impacts from heavy metals and sediment.

13.3 Baseline Environment

13.3.1 WFD Catchment Overview

The study area lies within Hydrometric Area (HA) 09 (Liffey and Dublin Bay) and is within the River Liffey catchment. The Liffey and Dublin Bay Catchment Summary (Liffey Catchment Assessment 2010 – 2015 (HA 09) (EPA 2018) describes this catchment as including the area drained by the River Liffey and by all streams entering tidal water between Sea Mount and Sorrento Point in County Dublin, draining a total area of 1,616km^2. There are four water bodies within the study area in this catchment; the Liffey Estuary Upper, Tolka_040, the Tolka_050 and the Royal Canal Main Line (Liffey and Dublin Bay) (hereafter referred to as the Royal Canal) (refer to Figure 13.1 Hydrological Study Area in Volume 3 of this EIAR). The largest urban centre in the catchment is Dublin City. The other main urban centres relevant to the study area are Blanchardstown, Ashtown and Cabra. The Liffey and

Dublin Bay catchment contains the largest population (approximately 1,255,000) of any catchment in Ireland and is characterised by a sparsely populated, upland south-eastern area underlain by granites and a densely populated flat, low lying limestone area over the remainder of the catchment basin. The majority of the population in the catchment is in this low-lying limestone area which is also heavily urbanised and industrialised.

13.3.2 EPA Surface Water Monitoring

The EPA assesses the water quality of rivers and streams across Ireland using a biological assessment method (EPA 2018). The EPA assigns biological river quality (biotic index) ratings from Q5 to Q1 to watercourse sections (refer to Table 13.6). Q5 denotes a watercourse with high water quality and high community diversity, whereas Q1 denotes very low community diversity and bad water quality. This data will be used to inform baseline receptor importance.

The WFD also considers heavily modified water bodies (HMWB) and artificial surface water bodies (AWB). The WFD requires HMWB and AWB to achieve good ecological potential rather than Good Status.

Table 13.6: EPA Scheme of Biotic Indices or Quality (Q) Values (EPA 2018).

Biotic Index 'Q' Value	WFD Status	Pollution Status	Condition	Quality Class
Q5, Q4 - Q5	High	Unpolluted	Satisfactory	Class A
Q4	Good	Unpolluted	Satisfactory	Class A
Q3 - Q4	Moderate	Slightly polluted	Unsatisfactory	Class B
Q3, Q2 - Q3	Poor	Moderately polluted	Unsatisfactory	Class C
Q2, Q1 - Q2, Q1	Bad	Seriously polluted	Unsatisfactory	Class D

13.3.3 Surface Water WFD Status

The EPA river dataset is designed as a geometric river network for monitoring, management and reporting purposes. The EPA has split up rivers and streams into smaller sections to allow areas to be easily distinguished. These segments are assigned segment codes (Estuaries and Canals are not assigned segment codes). The EPA's segmented coding and naming system has been applied throughout this Chapter.

Water bodies and their associated segments, which are contained within the study area, included in this assessment, are (refer to Figure 13.1 in Volume 3 of this EIAR):

- Powerstown (Dublin)_010;
- Tolka_030;
- Tolka_040;
- Tolka_050;
- Liffey Estuary Upper; and
- Royal Canal Main Line (Liffey and Dublin Bay).

The WFD status of the rivers and streams within the study area of the Proposed Scheme are detailed in Table 13.7.

Table 13.7: Surface Water WFD Status.

WFD Sub-Catchment	WFD Water body Name	Heavily Modified?	Type	Status (2013 – 2018)	Key Pressures: Elements Causing or with Potential to Cause Less Than Good Status	Risk Categorisation
Tolka_SC_010	Powerstown (Dublin)_010	Unknown	River	Poor	Agriculture	At Risk
Tolka_SC_010	Tolka_030	Unknown	River	Poor	Industry and Urban Run-off	At Risk

WFD Sub-Catchment	WFD Water body Name	Heavily Modified?	Type	Status (2013 – 2018)	Key Pressures: Elements Causing or with Potential to Cause Less Than Good Status	Risk Categorisation
Tolka_SC_020	Tolka_040	Unknown	River	Poor	Urban runoff and diffuse sources runoff	At Risk
Tolka_SC_020	Tolka_050	Unknown	River	Poor	Urban runoff, diffuse sources runoff, urban wastewater and SWOs	At Risk
N/A	Liffey Estuary Upper	No	Transitional	Good	Urban runoff and SWOs	At Risk
N/A	Royal Canal Main Line (Liffey and Dublin Bay)	Yes - AWB	Canal	Good ecological quality	NA	Not at Risk

13.3.4 Field Survey

Findings of the field surveys undertaken in March 2022 are provided in Table 13.8.

Table 13.8: Survey Information for Sites along the Proposed Scheme.

Survey Attribute	Survey Location 1	Survey Location 2	Survey Location 3	Survey Location 4	Survey Location 5
Location	Snugborough Rd crossing	Tolka Culvert extension via Mill Road	Mill Road crossing	Construction Compound NW of M50 junction	Construction Compound SE of M50 junction
Date	08 March 2022	08 March 2022	08 March 2022	08 March 2022	08 March 2022
Climate observations	Cloudy, some rain	Cloudy, some rain	Cloudy, some rain	Cloudy	Cloudy
Waterbody Crossed	Yes	Yes	Yes	No	No
Construction compound	No	No	No	Yes	Yes
Closest Waterbody	Tolka_040	Tolka_040	Tolka_040	Tolka_040	Royal Canal Main Line
Distance to Waterbody	10m down slope	0m (Direct crossing)	5 metres	Approx. 200m	Approx. 200m
River flow	Fast	No access to determine	Moderate	N/A	N/A
Water Quality	Clear, can see river bed	No access to determine	Clear, No visual evidence of contamination	N/A	N/A
Run-off pathway	Run off likely due to steep slope, and drainage on road above	Direct pathway down the bank during bank works	Potential runoff from road, no drainage on road	Surface water drains	Surface water drains
Run-off risk	High	High	Medium	High	High
Riverbed observations	Pebbles, smooth and rounded, shallow water at time of survey	No access to determine	Pebbles, large boulders visible. Some moss growing	N/A	N/A
Riverbank observations	Natural vegetation, no man made banks	No access to determine	Vegetation on both sides of river, erosion identified, no man made banks	N/A	N/A
Features	Bridge, culverts maybe under the road, outfall location also identified	No access to determine	Bridge	N/A	N/A
Barriers	N/A	Existing culvert walls	Bridge wall identified	N/A	N/A

Survey Attribute	Survey Location 1	Survey Location 2	Survey Location 3	Survey Location 4	Survey Location 5
Riparian Detail	Vegetation on both sides, straight channel	No access to determine	Sloping verges, Ivory, vegetated	N/A	N/A
Comments	Construction works near river and road, new culverts being installed.	No access to point, on motorway, no clear path identified, some photos taken from other side of culvert	Maybe natural ridges in river	Site is sloped from road, car park is again lower, run off potential is high, wall doesn't seem to be built too deep into ground. Doesn't slope towards river, some surface drains identified in car park, curb drains present along footpath, car wash in car park	Water body not visible for survey point. Construction compound. Steep slope, follows the path of the road lots of trees in area. Site has slight slopes around edges. Mounded in the middle, drains surrounding site on road. Some curb drains also identified

13.3.5 Designated Sites

The Designated Sites that are considered in Section 13.3.9 as part of the determination of sensitivity for each water body are located within the Liffey and Dublin Bay catchment. The sites described comprise Nutrient Sensitive Areas, shellfish areas, coastal bathing waters, Special Areas of Conservation (SAC), Special Protection Areas (SPA), proposed Natural Heritage Area (pNHA), Nutrient Sensitive Areas, salmonid rivers, shellfish areas and marine bathing waters.

A review of the Natura 2000 network was conducted to determine those European sites which are within the study area and / or hydrologically connected to the water bodies listed in Section 13.3.1. A full assessment of potential impacts on designated European Sites, including hydrological links and water dependent species or habitats, is contained within Chapter 12 (Biodiversity) and Figure 12.2 in Volume 3 of this EIAR shows the hydrological connectivity to the Proposed Scheme. The following European sites were identified to be relevant to this assessment:

- Howth Head SAC (approximately 11.72km from the closest point of the Proposed Scheme) (site code: 000202);
- South Dublin Bay SAC (approximately 4.62km from the closest point of the Proposed Scheme) (site code: 000210);
- North Dublin Bay SAC (approximately 6.03km from the closest point of the Proposed Scheme) (site code: 000206);
- North Bull Island SPA (approximately 6.02km from the closest point of the Proposed Scheme) (site code: 004006);
- South Dublin Bay and River Tolka Estuary SPA (approximately 2.89km from the closest point of the Proposed Scheme) (site code: 004024); and
- Howth Head Coast SPA (approximately 14.46km from the closest point of the Proposed Scheme) (site code: 004113).

In addition, the following Natural Heritage Areas proposed for designation under Irish national legislation (pNHAs) located within the study area / hydrologically connected are:

- Dolphins, Dublin Docks (site code: 000201);
- Howth Head pNHA (site code: 000202);
- North Dublin Bay pNHA (site code: 000206);
- South Dublin Bay pNHA (site code: 000210); and
- Royal Canal pNHA (site code: 002103).

There is one Nutrient Sensitive Areas in the 500m study area. The Liffey Estuary Upper is the designated under the UWWT Directive (refer to Figure 13.2 in Volume 3 of this EIAR).

There are no designated shellfish areas within 2km of the Proposed Scheme.

There are seven designated marine bathing waters downstream of the Proposed Scheme. The EPA published its Bathing Water Quality - A Report for the Year 2020 in May 2020 (EPA 2020b) and the website beaches.ie keeps this information regularly updated. The beaches and the most up to date assessment (checked February 2022 and based on May to September 2021 sampling results) of their quality is provided below:

- Dollymount Strand (approximately 10km from the closest point of the Proposed Scheme) – Poor Quality;
- North Bull Wall (approximately 8km from the closest point of the Proposed Scheme) – Poor Quality
- Half Moon (approximately 10km from the closest point of the Proposed Scheme) – Excellent Quality;
- Shelley Banks (approximately 12km from the closest point of the Proposed Scheme) – excellent Quality;
- Sandymount Strand – (approximately 13km from the closest point of the Proposed Scheme) Poor Quality; and
- Merrion Strand (approximately 13.5km from the closest point of the Proposed Scheme) – Sufficient quality;
- Seapoint – (approximately 14km from the closest point of the Proposed Scheme) Excellent Quality.

No designated salmonid rivers were identified within the study area during the desk study.

13.3.6 Drinking Water Supplies (Surface Water Abstractions)

There are no Geological Survey Ireland (GSI) Public Supply source Protection Areas or National Federation of Group Water Schemes (NFGWS) Group Scheme Source Protection Areas within the study area. None of the river segments within the study area is designated as a Drinking Water River.

13.3.7 Known Pressures

The EPA online interactive map and database for water (EPA 2021) was reviewed to identify the pressures on water bodies and the presence of point source discharges from EPA licenced activities within the study area. Pressures common to all water bodies in the study area are discharges from urban wastewater systems (via Storm Water Overflows (SWOs) and Urban Runoff. Further details on these for each water body are provided in Section 13.3.9.

There are no IE / IPPC sites or WWTP in the study area. However, there are eighteen SWOs in the study area. One discharges to the Liffey Estuary Upper and nine discharge locations are unknown. The remainder go to Ringsend WwTP.

13.3.8 Existing Drainage

A desk study of the existing road drainage system within the study area, using online mapping tools (Google Street View and OpenStreetMap) and historical sewer network information, was conducted to determine the existing road drainage and level of treatment and attenuation provided currently. Based on this assessment, the existing road and bridge network consists primarily of curb and gully, with no treatment or attenuation within the network. No SuDS were identified within the study area.

The pressures identified for the water bodies in the study area include diffuse pollution and discharges from SWOs. These pressures result from failures in the drainage system, either as a result of insufficient capacity, poor maintenance or incorrectly connected wastewater from domestic or commercial properties. It is likely that some or all of these issues are present within the study area.

Surface water runoff from the Proposed Scheme will discharge directly to each of the water bodies, with the exception of Liffey Estuary Upper; discharges to this water body are via emergency overflows only from the Combined Sewer system. Note, in some cases the receiving water for the surface water system is uncertain and could be one of two or three water bodies. In these cases, as a reasonable worst-case scenario, it is assumed that the most sensitive water body is the receiving water.

The Proposed Scheme is described as per the five subsections below:

- Section 1: N3 Blanchardstown Junction to Snugborough Road;
- Section 2: Snugborough Road to N3 / M50 Junction;
- Section 3: N3 / M50 Junction to Navan Road / Ashtown Road Junction;
- Section 4: Navan Road / Ashtown Road junction to Navan Road / Old Cabra Road Junction; and
- Section 5: Navan Road / Old Cabra Road junction to Ellis Quay.

Table 13.9 provides the existing drainage along the Proposed Scheme.

Table 13.9: Existing Drainage Details

Catchment	Existing Network Type	Proposed Scheme Section ID	Water body
Catchment 1	Surface Water (Storm)	N3 Blanchardstown Jn to Snugborough Road	Tolka_040
Catchment 2	Surface Water (Storm)	N3 Blanchardstown Jn to Snugborough Road	Tolka_040
Catchment 3	Surface Water (Storm)	N3 Blanchardstown Jn to Snugborough Road	Tolka_040
Catchment 4	Surface Water (Storm)	N3 Blanchardstown Jn to Snugborough Road	Tolka_040
Catchment 5	Surface Water (Storm)	N3 Blanchardstown Jn to Snugborough Road	Tolka_040
Catchment 6	Surface Water (Storm)	Snugborough Road to N3/M50 Jn	Tolka_040
Catchment 7	Surface Water (Storm)	Snugborough Road to N3/M50 Jn	Tolka_040
Catchment 8	Surface Water (Storm)	Snugborough Road to N3/M50 Jn	Tolka_040
Catchment 9	Surface Water (Storm)	Snugborough Road to N3/M50 Jn	Tolka_040
Catchment 10	Surface Water (Storm)	Snugborough Road to N3/M50 Jn	Tolka_040
Catchment 11	Surface Water (Storm)	N2/M50 Jn to Navan Rd/Ashtown Rd Jn	Tolka_050
Catchment 12	Surface Water (Storm)	N2/M50 Jn to Navan Rd/Ashtown Rd Jn	Royal Canal
Catchment 13	Surface Water (Storm)	N2/M50 Jn to Navan Rd/Ashtown Rd Jn	Royal Canal
Catchment 14	Surface Water (Storm)	Navan Rd/Ashtown Rd Jn to Navan Rd/Old Cabra Rd Jn	Royal Canal
Catchment 15	Surface Water (Storm)	Navan Rd/Ashtown Rd Jn to Navan Rd/Old Cabra Rd Jn	Dublin Zoo ponds then Ringsend WwTP
Catchment 16	Surface Water (Storm) & Combined	Navan Rd/Ashtown Rd Jn to Navan Rd/Old Cabra Rd Jn	Dublin Zoo ponds then Ringsend WwTP
Catchment 17	Surface Water (Storm)	Navan Rd/Ashtown Rd Jn to Navan Rd/Old Cabra Rd Jn	Ringsend WwTP
Catchment 18	Surface Water (Storm) & Combined	Navan Rd/Ashtown Rd Jn to Navan Rd/Old Cabra Rd Jn	Ringsend WwTP
Catchment 19	Surface Water (Storm) & Combined	Navan Rd/Old Cabra Rd Jn to Ellis Quay	Ringsend WwTP
Catchment 20	Surface Water (Storm) & Combined	Navan Rd/Old Cabra Rd Jn to Ellis Quay	Liffey Estuary Upper

Catchment	Existing Network Type	Proposed Scheme Section ID	Water body
Catchment 21	Combined	Navan Rd/Old Cabra Rd Jn to Ellis Quay	Ringsend WwTP

13.3.9 Surface Water Features

The four WFD water bodies within the study area, the Tolka_040, Tolka_050, the Royal Canal and Liffey Estuary Upper are discussed in this Section. In addition, the Powerstown (Dublin)_010 and the Tolka_030, which are outside of the study area have been included (see Sections 13.3.9.1 and 13.3.9.2) because the assessment of displaced traffic has identified that some short sections of road, which most likely drain to these water bodies are predicted to have >10,000 AADT under the Do Something scenarios for 2028 and/or 2043 as a result of the Proposed Scheme. The Tolka_030 flows into the Tolka_040, which flows to the Tolka_050 and then into the Tolka Estuary and subsequently Dublin Bay. The Royal Canal flows into the Liffey Estuary Upper and subsequently Dublin Bay (refer to Figure 13.1 Surface Water Study Area in Volume 3 of this EIAR). None of these water bodies is identified as a 'Priority Area for Action' in the RBMP 2018 – 2021 (DHPLG 2018).

Only one surface water feature within the study area was identified which is not classified as a WFD water body: the pond system at Dublin Zoo. Table 13.10 summarises the water bodies within the study area, their location in relation to the Proposed Scheme sections, their distance from that section and whether they are crossed.

Table 13.10: Distance of the Water bodies Within the Study Area to the Proposed Scheme and the Individual Sections of the Proposed Scheme

Water body	Nearest Scheme Section	Approx. Distance from Proposed Scheme (m)	Number of Crossings
Powerstown (Dublin)_010	Redistributed traffic	2100	0
Tolka_030	Redistributed traffic	1700	0
Tolka_040	N3 Blanchardstown Junction to Snugborough Road	0	1
Tolka_040	Snugborough Road to N3/M50 Junction	0	3
Tolka_050	N3/M50 Junction to Navan Road/Ashtown Road Junction	215	0
Royal Canal	N3/M50 Junction to Navan Road/Ashtown Road Junction	0	2
Dublin Zoo Ponds	Navan Rd/Ashtown Rd Jn to Navan Rd/Old Cabra Rd Jn	500	0
Liffey Estuary Upper	Navan Road/Old Cabra Road Junction to Ellis Quay	50	0

13.3.9.1 Powerstown (Dublin)_010

The Powerstown (Dublin)_010 has Poor status and is At Risk of not achieving Good Status by 2027. It is impacted by agricultural pressures.

In terms of assigning sensitivity, the poor WFD Status would normally lead to a determination of low sensitivity. It is not a designated Nutrient Sensitive Area, nor is it protected under European or National legislation. It is hydrologically connected to the Tolka Estuary and North Dublin Bay SAC, however this is >5km (17km) from the downstream extent of the water body. It is not a designated salmonid river under S.I. No. 293/1988 - European Communities (Quality of Salmonid Waters) Regulations 1988 (the Salmonid Regulations). Whilst IFI state that the Tolka (the downstream water body) supports salmonid populations, ecological monitoring of this water body indicate that it remains Poor quality. It is also culverted in places and channelised alongside fields and through a golf course. As a precautionary measure, however, the water body is assigned Medium sensitivity.

13.3.9.2 Tolka_030

This water body is outside of the Study Area, however it has been included because the assessment of displaced traffic has identified that some short sections of road, which most likely drain to the Tolka_030 are predicted to have >10,000 AADT under the Do Something scenarios for 2028 and/or 2043 as a result of the Proposed Scheme.

The Tolka_030 has Poor WFD status and is At Risk of not achieving Good Status by 2027. It is impacted by Storm Water Overflows and point source emissions; in 2019 a chemical spill from a licensed facility has been identified as a significant pressure.

Despite its Poor WFD Status and biological quality, Inland Fisheries Ireland (IFI) in their response to the consultation stated that the Tolka River (along its length) supports Atlantic salmon, Lamprey and Brown trout populations in addition to other fish species and provides a particularly important nursery function for salmonid species throughout. Salmon were recorded in the Glasnevin area in 2011.

In terms of assigning sensitivity, the poor WFD Status would normally lead to a determination of low sensitivity. It is not a designated Nutrient Sensitive Area, nor is it protected under European or National legislation. It is hydrologically connected to the Tolka Estuary and North Dublin Bay SAC, however this is >5km (17km) from the downstream extent of the water body. It is not a designated salmonid river under S.I. No. 293/1988 - European Communities (Quality of Salmonid Waters) Regulations 1988 (the Salmonid Regulations). Whilst IFI state that the Tolka supports salmonid populations, ecological monitoring of this water body indicates that it remains Poor quality. It is culverted in places, however its size and nature along most of its length may allow for salmonid species to be present. As a precautionary measure, however, the water body is assigned High sensitivity.

13.3.9.3 Tolka_040

The Tolka_040 is 9.23km and consists of the main channel through Blanchardstown, as well as an unnamed minor tributary that joins the main channel at Connolly Hospital. The Tolka_050 segment is 9.25km and consists of the main channel from Blanchardstown to Glasnevin, as well as three minor unnamed tributaries in Finglas. For both segments the catchment contributions are considered to be primarily urban.

The Proposed Scheme will cross the Tolka_040 twice between Snugborough Road to N3/M50 Junction. There are areas of Alluvial Woodland (Annex 1 Habitat) alongside the Tolka_040 between Blanchardstown Road North and Snugborough Road and also between Mill Road and River Road.

The Tolka_040 has Poor WFD status and is At Risk of not achieving Good Status by 2027. The key pressures include urban runoff and diffuse sources runoff.

The most recent Biological Q Value assessment of the Tolka River was undertaken in 2019. Q values are outlined in Table 13.6. Five stations were monitored along the length of the watercourse. The lowest Q Value along the River Tolka was Q2 to Q3 at Castle Curragh Park which is located upstream of the Proposed Scheme, and this equates to poor water quality. Three of the five stations gave a value of Q3 which is also poor quality, and the fifth station recorded a value of Q3 to Q4, equating to moderate water quality. There are limited notes provided for the River Tolka Quality Survey (EPA 2020b), but the following is given:

'*In July 2019 , the uppermost station (0300) declined to Poor ecological conditions and was dominated by pollution tolerant taxa. In contrast, Station 0600 improved to Moderate conditions, while 0800, 1000 and 1100 all remained Poor*.'

In terms of assigning sensitivity, the poor WFD Status would normally lead to a determination of low sensitivity. It is not a designated Nutrient Sensitive Area, nor is it protected under European or National legislation. It is hydrologically connected to the Tolka Estuary and North Dublin Bay SAC, however these are >5km (8.5km) from the downstream extent of the water body. It is not a designated salmonid river under S.I. No. 293/1988 - European Communities (Quality of Salmonid Waters) Regulations 1988 (the Salmonid Regulations) , however the confirmed presence of salmonid species by IFI means that, as a precautionary measure the water body is assigned High sensitivity.

13.3.9.4 Tolka_050

The Tolka_050 will not be crossed by the Proposed Scheme although the Tolka_050 flows parallel to the Proposed Scheme, approximately 300m north-east of the R147 Navan Road.

The Tolka_050 has Poor WFD status and is At Risk of not achieving Good Status by 2027. The key pressures include urban runoff and diffuse sources runoff.

In terms of assigning sensitivity, the Tolka_050 is of poor WFD Status and would normally be of low sensitivity. The Tolka_050 is not a protected area, however it is hydrologically connected to the Tolka Estuary and North Dublin Bay SAC which is >2km and <5km (2.8km) from the downstream extent of the water body. It is also confirmed as supporting salmonid species by IFI. Therefore, the Tolka_050 is assigned High sensitivity.

13.3.9.5 Royal Canal (Royal Canal Main Line (Liffey and Dublin Bay))

The Royal Canal Main Line (Liffey and Dublin Bay) is an artificial water body (AWB), primarily used for recreation. The land use associated with the Royal Canal, contained within the study area, is mostly urban / industrial. Constructed in the 18th century, shortly after the Grand Canal, the Royal Canal is 145km long and runs from the River Liffey in Dublin to Cloondara on the River Shannon, with an 8km branch line into the town of Longford. Waterways Ireland are responsible for the monitoring of this water body.

The WFD considers heavily modified water bodies (HMWB) and AWB and requires them to achieve good ecological potential rather than Good Status. The Royal Canal has Good Ecological Potential.

The IFI states in its consultation response that the Royal Canal supports significant populations of coarse fish and a range of other freshwater aquatic species, plus all associated floral and faunal components in adjacent habitats.

In terms of assigning sensitivity, the WFD Good Ecological Potential of the Royal Canal means that it would be of High sensitivity. It is protected by national legislation and is designated a potential Natural Heritage Area (pNHA). It has a direct connection to Liffey Estuary Lower, which is in the Liffey Nutrient Sensitive Area. The Royal Canal is >2km and <5km from South Dublin Bay and Tolka estuary SPA (3.3km) and North Dublin Bay SAC (4km). The presence of a coarse fishery is also a consideration. Taking all things together, the water body is assigned Very High sensitivity.

13.3.9.6 Liffey Estuary Upper

The Liffey Estuary Upper is a transitional water body and is within the Liffey Nutrient Sensitive Area. It is fed by the Camac_040, Liffey_190 and Poddle_010 and flows into Liffey Estuary Lower before reaching Dublin Bay. Liffey Estuary Upper has a Good Status however it is classified as ‘At Risk’ of not achieving the WFD objective of Good Status by 2027, which means a deterioration in status is anticipated. The main risk is urban wastewater from SWOs and from the combined sewer system discharging raw sewage into watercourses during storm events or in the event of a blockage. If the combined sewer system is under capacity for the volumes of surface and wastewater it receives the SWOs can discharge more frequently than they should and potentially in times of relatively low flows in the river, leading to water quality issues in receiving waters. The key pressures are considered to be nutrient pollution and alterations to habitats due to morphological changes.

In terms of assigning sensitivity, the WFD Good Status of the Liffey Estuary Upper means that it would be of High sensitivity. It is >2km and <5km (approximately 4km) from South Dublin Bay and Tolka Estuary SPA and >5km (5.5km) from North Dublin Bay SAC. However, it is in the Liffey Nutrient Sensitive Area and therefore it is assigned Very High sensitivity.

13.3.9.7 Non-WFD Classified Surface Water Features

A short section of the existing surface water system along the route of the Proposed Scheme discharges to the pond system at Dublin Zoo. The outlet from these ponds is connected into the combined sewer system. The ponds may be connected to each other, or each outlet may connect to the combined sewer however at least one

will receive surface water from the route of the Proposed Scheme. They are ornamental ponds likely to contain coarse fish and would be sensitive to increased sediment loads.

In terms of assigning sensitivity, a non-WFD surface water feature would normally be classified as low sensitivity, however given the amenity value of these ponds and the likelihood of fish species to be present, the ponds are considered to be of Medium sensitivity.

13.3.9.8 Summary of Baseline Receptor Sensitivity

Table 13.11: Summary of Baseline Receptor Sensitivity

Water body	Attributes	Indicator / Feature	Sensitivity
Powerstown (Dublin)_010	River	Poor status, Culverted. Some possibility of salmonid species.	Medium
Tolka_030	River	Poor status. Open, natural form for most of its length. Reasonable possibility of salmonid species	High
Tolka_040	River	Poor status. Open, natural form for most of its length. Reasonable possibility of salmonid species	High
Tolka_050	River	Poor status. Open, natural form for most of its length. Reasonable possibility of salmonid species	High
Royal Canal Main Line (Liffey and Dublin Bay)	AWB	Good ecological potential pNHA Direct connection to Liffey Estuary	Very High
Liffey Estuary Upper	Transitional water body	Good status Designated Nutrient Sensitive Area	Very High
Dublin Zoo Ponds	Pond	Amenity area, non WFD, fishery	Medium

13.3.10 Flood Risk

Flood Risk is not considered as part of the impact assessment in this Chapter; a separate Site Specific Flood Risk Assessment (FRA) has been completed for the Proposed Scheme (See Appendix 13.2 in Volume 4 of this EIAR). The FRA has been prepared for the Proposed Scheme in accordance with the Department of the Environmental, Heritage and Local Government (DEHLG) and the Office of Public Works (OPW) Planning System and Flood Risk Management Guidelines for Planning Authorities (hereafter referred to as the FRM Guidelines) (DEHLG and OPW 2009). A copy of the FRA is included in Appendix A13.2 Site Specific Flood Risk Assessment in Volume 4 of this EIAR.

The FRM Guidelines define three Flood Zones, namely:

- Flood Zone A – where the probability of flooding from rivers and the sea is highest (greater than 1% Annual Exceedance Probability (AEP) or 1 in 100 year for river flooding or 0.5% AEP or 1 in 200 for coastal flooding);
- Flood Zone B – where the probability of flooding from rivers and the sea is moderate (between 0.1% AEP or 1 in 1,000 year and 1% AEP or 1 in 100 year for river flooding and between 0.1% AEP or 1 in 1,000 year and 0.5% AEP or 1 in 200 year for coastal flooding); and
- Flood Zone C – where the probability of flooding from rivers and the sea is low (less than 0.1% AEP or 1 in 1,000 for both river and coastal flooding).

Flood Zone C covers all areas which are not in Flood Zone A and Zone B.

13.3.10.1 Historic Flooding

There are a number of historic flood events at different locations along or near to the Proposed Scheme.

13.3.10.2 Coastal Flood Risk

The nearest distance of the Proposed Scheme to the coastal boundary, located at Liffey Quay, measures approximately 1km, and is elevated above sea level. The route is deemed to be at low risk of tidal flooding from the River Liffey.

13.3.10.3 Groundwater Flood Risk

The OPW Preliminary Flood Risk Assessments Groundwater Flooding Report concludes that ground water flooding is largely confined to the West Coast of Ireland due to the hydrogeology of the area. The risk of groundwater flooding is considered to be low

13.3.10.4 Pluvial Flood Risk

The risk of pluvial flooding along the majority of the Proposed Scheme is high.

13.3.10.5 Fluvial Flood Risk

The route lies in Flood Zone C and in an area at low risk of flooding from surrounding rivers, such as the Rivers Tolka and Liffey.

13.4 Potential Impacts

This section presents potential impacts that may occur due to the Proposed Scheme, taking into account the proposed drainage design as set out in Section 13.4.1, but in the absence of any further mitigation. This informs the need for mitigation or monitoring to be proposed (refer to Section 13.5). Predicted 'residual' impacts taking into account any proposed mitigation is then presented in Section 13.6.

13.4.1 Characteristics of the Proposed Scheme

Full details of the Proposed Scheme are provided in Chapter 4 (Proposed Scheme Description) but elements of relevance to the surface water impact assessment are provided below.

13.4.1.1 Impermeable Areas and Drainage Design

The drainage design is based on a number of general principles, which are set out in the document 'BusConnects Core Bus Corridor Drainage Design Basis' (NTA 2020). A SuDS drainage design has been developed as a first preference and in accordance with the SuDS Management Train described in the CIRIA SuDS manual (CIRIA 2015). The CIRIA SuDS Manual recommends that when considering SuDS solutions, the preferred approach is a hierarchy whereby runoff using source control solutions (e.g. pervious surfacing) are considered first; where source control is not possible or cannot fully address an increase in runoff from a development, residual flows are then managed using site controls (e.g. bioretention/infiltration basins). If this is not practical or residual flows remain above existing runoff rates, regional controls (e.g. attenuation ponds or tanks) are used. SuDS provide the dual benefits of controlling flows and treating water quality.

In areas where the catchment is proposed to remain unchanged (as no additional impermeable areas are proposed), the design generally consists of relocating existing gullies (where possible) to new locations.

In areas, where an increase in impermeable area is proposed, attenuation is generally provided in the form of SuDS such as permeable paving, bio retention areas, rain gardens, green roofs, filter drains (FD) and tree pits. As explained in the 'BusConnects Core Bus Corridor Drainage Design Basis' (NTA 2020), a hierarchical approach to select SuDS drainage solutions has been applied. If following the site selection process, the provision of SuDS is not possible, attenuation is provided in the shape of oversized pipes (OSP). These SuDS measures allow a level of treatment and/or attenuation to be provided before discharge to the network, reducing the impact on water quality as well as preventing an increase in runoff rates.

The drainage design principles have informed the drainage design (see Chapter 4 (Proposed Scheme Description) and Appendix A4.1 in Volume 4 of this EIAR) which will ensure no net increase in the surface water flow discharged to these receptors.

The details of drainage measures proposed for each catchment and subsequently each water body are provided in Table 13.14. No new outfalls are proposed.

Table 13.12: Proposed SuDs and Impermeable Area changes

Existing Catchment Reference	Water body	Approx. Surface Area m^2			SuDS and Attenuation Measures Proposed
		Existing impermeable area	Additional permeable area	Percentage change	
Catchment 1	Tolka_040	19332	6097	32	Bio retention areas, Tree Pits, OSP
Catchment 2	Tolka_040	17950	5676	32	Bio retention areas, Tree Pits, OSP, FD, green roof
Catchment 3	Tolka_040	N/A	0	0	None
Catchment 4	Tolka_040	307	94	31	Bio retention areas, FD
Catchment 5	Tolka_040	2347	1577	67	Bio retention areas, FD
Catchment 6	Tolka_040	2901	249	9	Bio retention areas, permeable paving
Catchment 7	Tolka_040	4182	2957	71	Bio retention areas, permeable paving, OSP, FD
Catchment 8	Tolka_040	11413	3029	27	Bio retention areas, permeable paving, FD
Catchment 9	Tolka_040	N/A	0	0	None
Catchment 10	Tolka_040	N/A	0	0	None
Catchment 11	Tolka_050	4126	1892	46	Bio retention areas, FD, Swale
Catchment 12	Royal Canal	19125	4544	24	Bio retention areas, Tree Pits, OSP, FD
Catchment 13	Royal Canal	2888	600	21	Bio retention areas, Tree Pits, FD
Catchment 14	Royal Canal	1253	232	19	Bio retention areas
Catchment 15	Dublin Zoo ponds then Ringsend WwTP	6211	974	16	Bio retention areas
Catchment 16	Dublin Zoo ponds then Ringsend WwTP	11366	1705	15	Tree pits, FD, OSP
Catchment 17	Ringsend WwTP	4382	431	10	Tree pits, FD
Catchment 18	Ringsend WwTP	3474	336	10	Bio retention areas
Catchment 19	Ringsend WwTP	N/A	0	0	Bio retention areas, Tree Pits, FD
Catchment 20	Liffey Estuary Upper	N/A	0	0	Bio retention areas
Catchment 21	Ringsend WwTP	N/A	0	0	Bio retention areas

Table 13.13: Summary of Increased Impermeable areas per water body

Water body	Approx. Impermeable Surface Area		
	Existing impermeable area	Additional permeable area	Percentage change
Tolka_040	58432	19679	34
Tolka_050	4126	1892	46
Royal Canal	23266	5376	23
Dublin Zoo Ponds	17577	2679	15
Liffey Estuary Upper	N/A	0	0
Ringsend	7856	767	10

13.4.1.2 Key Infrastructure Proposed

Key infrastructure elements for the Proposed Scheme are described in detail within Chapter 4 (Proposed Scheme Description) of this EIAR. Chapter 5 (Construction) describes the Construction Phase for the works related to these key infrastructure elements.

13.4.2 Do Nothing Scenario

In the Do Nothing Scenario the Proposed Scheme would not be implemented and there would be no changes to existing highway infrastructure, so infrastructure provision for buses, pedestrians and cyclists would remain the same.

The Baseline (Section 13.3) includes a description of the current status of the environment in and around the area in which the Proposed Scheme will be located and identifies the existing pressures on the water bodies within the study area; these are identified and categorised under the RBMP 2018-2021 process under baseline conditions (i.e. what is there at present) and reported by the EPA. The RBMP categorises significant pressures impacting water bodies in Ireland into 14 categories, and identifies measures and actions aimed at addressing each pressure. This supports the analysis of future trends expected in the water environment in order to determine the 'evolution of the baseline without the development'. Future trends will be more noticeable, predictable and measurable in the short to medium-term in relation to water quality, whereas hydrological and hydromorphological changes are subject to more long-term trends.

Future trends are determined based on the significant pressures identified under the RBMP, and the measures and actions in relation to policy and monitoring identified for the water bodies to meet the requirements of the WFD Directive and any information available detailing progress on those measures or actions.

The most significant pressures to water bodies 'At Risk' of achieving Good status within the Tolka_040 and Tolka_050 sub-catchments are urban runoff from diffuse urban sources, including misconnections.

In relation to the Tolka_050, a number of actions have been taken by Fingal County Council to identify the source of pressures and alleviate some impacts, including constructing wetlands at Cardiff Bridge, Tolka Park and monitoring of the water body. Dublin City Council monitoring has also identified some potential pressures, including an historic landfill site at Tolka Valley Park which leaches into the water body. Dublin City Council plan to collect leachate via a land drain and divert it into a constructed wetland.

Discharges from Wastewater Treatment Plants (WwTPs) and agglomeration networks (including discharges from Storm Water/Emergency Overflows) have been identified as pressures within the study area. Irish Water is currently constructing the Blanchardstown Regional Drainage Scheme (see https://www.water.ie/projects/local-projects/blanchardstown-regional-d/) in Waterville Park, which is part of the Tolka Valley Park. This will include a new pumping station at Mill Road. The Blanchardstown Regional Drainage Scheme is being carried out to:

- Expand the capacity of the wastewater network and facilitate existing and future residential and commercial development;
- Enable the long term social and economic development of the greater Blanchardstown region and surrounding areas including Meath; and
- Reduce the frequency and volume of untreated wastewater overflows from the wastewater network to the River Tolka, protecting habitats and ecosystems in the River Tolka and Dublin Bay.

The draft RBMP includes an action for Irish Water to continue investment in wastewater infrastructure with Irish Water investing in 83 wastewater treatment plants and 10 collection networks at an estimated cost of €1.022bn, over the period 2020-2024. In addition. As part of Ireland's National Recovery and Resilience Plan (2021), Irish Water will be delivering its enhanced Ambition Programme, which aims to deliver 10 priority wastewater treatment plant projects whose discharges have been identified as being significant pressures on receiving water bodies.

With these investigations, programmes and actions in place to locate and improve deficient infrastructure, it is anticipated that pressures from urban wastewater and urban runoff will be reduced over the coming years. Therefore, in the absence of the Proposed Scheme the surface water environment in the area is anticipated to improve particularly in relation to water quality.

13.4.3 Do Minimum

The potential for changes in traffic loading on side roads, as set out in Section 13.2.4.5 of this chapter, means that the assessment of potential operational impacts from the Proposed Scheme is required to consider an additional future baseline scenario, as well as Do Nothing; Do Minimum, in line with the assessment of impacts on traffic as set out in Chapter 6 (Traffic and Transport).

The 'Do Minimum' scenario (Opening Year 2028, Design Year 2043) represents the likely traffic and transport conditions of the direct and indirect study areas including for any transportation schemes which have taken place, been approved or are planned for implementation, without the Proposed Scheme in place. This scenario forms the reference case by which to compare the Proposed Scheme ('Do Something') for the quantitative assessments. Further detail on the Proposed Scheme and demand assumptions within this scenario is included in Chapter 6 (Traffic & Transport).

The outputs of the transport modelling for these future scenarios are used in the operational impact assessment in Section 13.5.3 of this chapter. In terms of the potential future baseline of the surface water environment under these two scenarios, there is a great deal of uncertainty, however it is reasonable to assume that the measures set out in the current and draft RBMPs (once agreed) will be implemented and improvements to water bodies in terms of their biological, water quality and hydromorphology will continue to enable as many water bodies as possible to achieve 'Good' status by 2027.

13.4.4 Construction Phase

13.4.4.1 Introduction

Chapter 5 (Construction) outlines the principal Construction Phase activities required to complete the Proposed Scheme and includes details of these activities such as new or improved bridges, road widening and narrowing, new and / or improved footpaths, cycle tracks, pavement repairs, road resurfacing, junction upgrades, new or improved lighting, bus stops, retaining walls and any other upgrade works.

In addition to a detailed description of the works involved, Chapter 5 (Construction) also details the location of construction compounds, the location and duration of any necessary traffic diversions, hours of working, and numbers of personnel involved.

The duration of the Construction Phase is estimated to be two years. The Construction Compounds will be in place for the full duration of the extent of the works they support and will be removed following completion of the works they support. Three construction compounds are proposed:

- Construction Compound BL1 at the car park in Corduff Park, approximately 15m from the Tolka_040 at its nearest point;
- Construction Compound BL2 at Junction 6 Castleknock, to the west of the N3/M50 roundabout at an existing car park serving a retail area, approximately 120m from the Tolka_040; and
- Construction Compound BL3 which is divided into two areas by the Navan Road slip road. For the purposes of this assessment the areas are denoted as BL3a and BL3b, with BL3a located to the north and BL3b located to the south of the slip road. BL3 on the eastern side of N3/M50 roundabout, between the slip roads and the railway which runs alongside the Royal Canal at this location.

The assessment considers the potential impacts of the Proposed Scheme construction activities prior to mitigation or control measures being implemented.

13.4.4.2 Potential Construction Phase Impacts

There are a number of potential construction related impacts which, in the absence of mitigation, could occur during the construction of the Proposed Scheme in relation to hydrology, water quality and hydromorphology. The potential for any of these types of impacts are considered for different construction activities for each water body within the study area. These potential Construction Phase impacts include:

13.4.4.2.1 Hydrology

- Disruption to local drainage systems due to diversions required to accommodate the construction works; and
- Temporary increase in hard standing areas and / or soil compaction during construction works which could result in temporary increased runoff rates to water bodies.

13.4.4.2.2 Water Quality

- Silty water runoff containing high loads of suspended solids from construction activities. This includes the stripping of topsoil / road surface during site preparation; the construction of widened roads; the dewatering of excavations and the storage of excavated material.
- Contamination of water bodies with anthropogenic substances such oil, chemicals or concrete washings. This could occur because of a spillage or leakage of oils and fuels stored on site or direct from construction machinery; and the storage of materials or waste in close proximity to water bodies or drains connected to the water bodies.
- Re-exposure of historically settled contaminants within or near to water bodies because of working within or in near to the water body.

13.4.4.2.3 Hydromorphology

- Increased sediment loading as a result of silty water runoff or dewatering activities, introducing a sediment plume, potentially leading to the smothering of bed substrate and changes to existing morphological features;
- Modifications to the morphological characteristics of the water body such as alterations to banks for construction of over bridges or other works.

13.4.4.3 Assessment of Potential Impacts on Receptors

Detailed assessment of the potential impacts on receptors is provided here and a summary table for all receptors provided in Table 13.14.

13.4.4.3.1 Tolka_040

The catchment area between N3 Blanchardstown Junction and N3/M50 Junction discharges to the Tolka_040 water body which runs to the north-east of the Proposed Scheme for much of this section. Works proposed for Blanchardstown Shopping Centre and Blanchardstown Centre include the addition of bus lanes onto existing carriageways, changing roundabouts to signalized junctions, the provision of a cycle track on existing carriageways and a cycle hub for 24 bicycles. These works are not deep or require extensive earthworks and do not involve the widening of any roads; there will be some loss of green space which will involve stripping of topsoil. This has the potential to impact upon the water body as a result of silty water runoff via surface water drains in the area. This has the potential to lead to short term, adverse impacts of small magnitude, resulting in an impact of Moderate to Slight significance.

Between Snugborough Road to N3/M50 Junction, the widening of the N3 has the potential to impact upon the water body as a result of soil stripping and excavations leading to silty water runoff into surface water drains, which are connected to the Tolka_040 in this location. This has the potential to lead to short term, adverse impacts of small magnitude, resulting in an impact of Moderate to Slight significance.

The Construction Compound BL1 located at Old Navan Road Car Park has the potential to result in impacts on the water body as a result of accidental spillages or runoff from stored materials and topsoil. The compound is proposed on an existing carpark. Any surface water drains in the car park discharge to the Tolka_040. This has the potential to lead to short to medium term, adverse impacts of large magnitude leading to an impact of Profound significance.

The widening of BR01 Tolka River Bridge has the potential for greater impacts on the water body than the other activities between Snugborough Road to N3/M50 Junction. The N3 currently crosses the Tolka_040 approximately 180m south-east of Snugborough Road. The proposed widening at BR01 Tolka River Bridge will be through an extension to the existing bridge, with new abutments set on new foundations to the south of the existing bridge. This will be in land adjacent to the water body and above existing gabion baskets which form the toe of the riverbank currently. The existing bridge structure will require partial demolition to facilitate the smooth tie in with the extension. Full details on the construction methodology for BR01 Tolka River Bridge are included in EIAR Chapter 5 (Construction).

Potential impacts associated with BR01 Tolka River Bridge construction works include disturbance to the water body as a result of silty water runoff from stripped lands directly adjacent to the banks of the Tolka_050. Machinery operating near to the water body also brings increased risk of oil and fuel leaks or spills. This has the potential to lead to short term, adverse impacts of large magnitude, resulting in an impact of Profound significance.

At Mill Road, pedestrian ramps (RW07A and RW07B) will be constructed to provide pedestrian access from/to Mill Road and new bus stops provided on the N3 Dual Carriageway. The temporary working area around RW07B Pedestrian Ramps on the northern side of the N3 Dual Carriageway is approximately 15m from the Tolka_040 at its closest point. In addition, BR02 Mill Road Bridge will also be widened to facilitate widening of the N3 Dual Carriageway. The EIAR Chapter 5 (Construction) provides full details on the major structure works at Mill Road.

Potential impacts associated with BR02 Mill Road Bridge and RW07A and RW07B Pedestrian Ramps construction works include the potential for silty water runoff or increased sediment loads. Surface water systems drain into the Tolka_040 in this area. This has the potential to lead to short term, adverse impacts of moderate magnitude, resulting in a Significant impact.

At the Construction Compound BL2 to the west of the M50, there is potential for impacts as a result of accidental spillages of oil or fuel or runoff from stored materials. The site is currently greenfield and it slopes down from the M50 on-slip to a short wall at its easternmost extent and mostly away from the access road to the retail park. There are gullies along the access road, however there are no surface water gullies in the car park itself. This has the potential to lead to short term, adverse impacts of small magnitude, resulting in an impact of Moderate to Slight significance.

13.4.4.3.2 Tolka_050

Construction Compounds BL3a and BL3b to the east have potential for impacts on the Tolka_050 as surface water drains outfall to it from these locations. Both locations are currently greenfield, however there are surface water drains in the road which bisects the two compound locations and so there is potential for these to act as a conduit to it if any spillages were to be significant enough to leave the compound area. Compound BL3a has the greatest potential for impacts as it is on a sloping site; it slopes towards the road and the surface water drains are on the same side of the road. This has the potential to lead to short to medium term, adverse impacts of medium magnitude, resulting in a Profound or Significant impact. Impacts from compound BL3b are anticipated to be lower and would be short term, adverse and of small magnitude, resulting in impacts of Slight to Moderate significance.

A new bus lane is proposed across what is currently a grassed area between the slip roads off the M50 roundabout (chainage A2700-A2900). There is potential for any silty water runoff to enter the Tolka_050 via surface water drains. This has the potential to lead to short term, adverse impacts of small magnitude, resulting in an impact of Moderate significance.

13.4.4.3.3 Royal Canal Main Line (Liffey and Dublin Bay)

The Royal Canal flows under the M50 roundabout, in a south easterly direction; the catchment to the south and west of the roundabout. However, the Proposed Scheme does not require any intrusive works at this location and therefore no impacts are anticipated.

From Chainages 2500 to 4800, the surface water is considered likely to drain to the Royal Canal. It is possible that it may drain to the Tolka_050, however for the purposes of this assessment, a reasonable worst-case scenario is considered whereby the surface water drains to the more sensitive receptors; the Royal Canal. The works to the M50 Roundabout and widening of Navan Road in this area will involve some intrusive works. As a result, impacts on the Royal Canal from silty water runoff could occur. This has the potential to lead to short term, adverse impacts of small magnitude, resulting in impacts which are Significant to Moderate significance.

The proposed works to the junction of Blackhorse Avenue/Ashtown Gate Road are not anticipated to cause impacts as it is proposed to simply signalize this junction and change the road layout (markings) for bus lanes and new bus priority signals. These works are more than 300m from the water body.

13.4.4.3.4 Liffey Estuary Upper

There are road widening works on the R147 Navan Road from Ashtown Road junction (Ch A4900) to Aughrim Street (Ch A8700), however for the most part surface waters are collected in the combined sewer system and so no impacts are anticipated on the water body. There is potential for impacts during the operation of SWOs in a storm, as these discharge to the Liffey Estuary Upper and could carry increased sediment. During a storm event this has the potential to lead to short-term, adverse impacts of negligible magnitude given the likelihood of the water body being in spate (high flow) at the time. This would result in an impact of Imperceptible significance.

The improvement of the junction at Ratoath Junction is anticipated to result in minimal sediment release. This has the potential to lead to short-term, adverse impacts of negligible magnitude, resulting in an impact of Imperceptible significance .

13.4.4.3.5 Dublin Zoo Ponds

The ponds at Dublin Zoo are ornamental ponds and may contain coarse fish which would be sensitive to increased sediment loads. There is potential for silty water runoff as a result of the road widening works in this area. This has the potential to lead to short term, adverse impacts of moderate magnitude, resulting in an impact of Moderate significance.

Table 13.14: Summary of Potential Construction Phase Impacts on Water bodies within the Study Area

Water body Name	Project Activity	Potential Impacts			
		Description of Potential Impacts	Sensitivity of Receptor	Magnitude of Impacts	Significance of Effects
Tolka_040	Road widening of the N3 Dual Carriageway	Increased surface water runoff; Increased sediment in runoff; Anthropogenic sources (fuel etc.)	High	Small	Moderate/Slight Short-term, Adverse
Tolka_040	Construction Compound BL1 Old Navan Road Car Park	Increased surface water runoff; Increased sediment in runoff; Anthropogenic sources (fuel etc.)	High	Large,	Profound Short to medium term Adverse
Tolka_040	BR01 Tolka Bridge Extension	Silty water runoff Oil spills	High	Large	Profound Short term, Adverse
Tolka_040	RW07A and RW07B Pedestrian Ramps and BR02 Mill Road Bridge	Silty water runoff Concrete washings	High	Moderate	Significant Short term Adverse
Tolka_050	Construction Compound BL2 at Junction 6 West of M50	Increased surface water runoff; Increased sediment in runoff; Anthropogenic sources (fuel etc.)	High	Small	Moderate/Slight Short to medium term Adverse
Tolka_050	Construction Compound BL3a at R147 East of the M50	Increased surface water runoff; Increased sediment in runoff; Anthropogenic sources (fuel etc.)	High	Moderate	Profound/Significant Short to medium term Adverse
Tolka_050	Construction Compound BL3b at R147 East of the M50	Increased surface water runoff; Increased sediment in runoff; Anthropogenic sources (fuel etc.)	High	Small	Moderate/Slight Short term Adverse
Tolka_050	Construction of new bus lane from M50 roundabout	Increased sediment in runoff	High	Small	Moderate/Slight Short term Adverse
Royal Canal Main Line (Liffey and Dublin Bay)	Widening of Navan Road	Increased sediment in runoff	Very High	Small	Significant/ Moderate Short term Adverse
Liffey Estuary Upper	Road widening and junction improvements	Increased surface water runoff; Increased sediment in runoff; Anthropogenic sources (fuel etc.)	Very High	Negligible	Imperceptible Short Term Adverse
Dublin Zoo Ponds	Road widening and junction improvements	Increased surface water runoff; Increased sediment in runoff; Anthropogenic sources (fuel etc.)	Medium	Moderate	Moderate Short term Adverse

13.4.5 Operational Phase

13.4.5.1 Overview of Potential Impacts

The potential impacts for the Operational Phase are related to water quality and hydromorphology only. No potential changes to hydrology are anticipated as the drainage design ensures no net increase in runoff rates.

Potential impacts that could occur include:

- Deterioration in water quality from increased levels of 'routine' road contaminates, such as hydrocarbons, metals, sediment and chloride (seasonal) due to:
  - Potential increase in pollution and sediment load entering surface water receptors from new or widened roads;
  - Increased impermeable area, and changes to the nature, frequency and numbers of vehicles using the new routes of the Proposed Scheme; and
  - Dispersal of traffic onto other the local road network which may drain to a different catchment or have less stringent pollution control infrastructure.
- Hydromorphology changes due to:
  - Changes in the flow regime due to increased surface water runoff or discharges, in new locations, resulting in changes to sedimentation processes and the structure of riverbanks.

13.4.5.2 Assessment of Potential Impacts on Receptors – Surface Water Runoff

Detailed assessments for each receptor are provided below, with a summary of impacts at Table 13.15.

13.4.5.2.1 Tolka_040

The impermeable area in the road corridor area draining to the Tolka_040 increases by 19,679m^2 which equates to a 34% increase.

This increase in impermeable area will be attenuated using bio retention/rain garden areas, permeable paving, tree pits, filter drains oversized pipes and green roofs. As a result, there will be no net increase in runoff to the water body. Some improvement in water quality may be observed as a result of the SuDS being employed. This has the potential to lead to permanent, beneficial impacts of negligible magnitude; resulting in an impact of Imperceptible significance.

13.4.5.2.2 Tolka_050

The impermeable area in the road corridor area draining to the Tolka_050 increases by 1,892m^2 which equates to a 46% increase. There is limited impermeable area draining to this water body and so the percentage appears high, albeit the increase is small compared to other catchments.

This increase in impermeable area will be attenuated using bio retention/rain garden areas, filtration drains and swales. As a result, there will be no net increase in runoff to the water body. Some improvement in water quality may be observed as a result of the SuDS being employed. This has the potential to lead to permanent, beneficial impacts of negligible magnitude; resulting in an impact of Imperceptible significance.

13.4.5.2.3 Royal Canal Main Line (Liffey and Dublin Bay)

The impermeable area in the road corridor area draining to the Royal Canal increases by 5,376m^2 which equates to a 23% increase.

This increase in impermeable area will be attenuated using bio retention/rain garden areas, tree pits, filtration drains and oversized pipes. As a result, there will be no net increase in runoff to the water body. Some improvement in water quality may be observed as a result of the SuDs being employed. This has the potential to

lead to a permanent, beneficial impact of negligible magnitude, resulting in an impact of Imperceptible significance.

13.4.5.2.4 Liffey Estuary Upper

The impermeable area in the road corridor area draining directly to the Liffey Estuary Upper does not increase. Therefore, there will be no impacts.

The impermeable area in the road corridor area draining to the Ringsend WwTP, with and indirect and intermittent connection to the Liffey Estuary Upper as a result of Storm Water Overflows (SWOs) discharging, increases by 767m^2, which equates to a 10% increase.

This increase in impermeable area will be attenuated using Bio retention/rain garden areas, tree pits and filtration drains and as a result, there will be no net increase in runoff to the combined sewer. As a result, there is a low likelihood of SWOs being triggered more frequently; they may discharge less often. As such, this has the potential to lead to. permanent, beneficial impacts of negligible magnitude; resulting in an impact of Imperceptible significance.

13.4.5.2.5 Dublin Zoo Ponds

The impermeable area in the road corridor area draining to the Dublin Zoo ponds increases by 2,679m^2, which equates to a 15% increase.

This increase in impermeable area will be attenuated using filtration drains, tree pits and oversized pipes. As a result, there will be no net increase in runoff to the ponds. Some improvement in water quality may be observed as a result of the SuDs being employed. This has the potential to lead to permanent, beneficial impacts of negligible magnitude; resulting in an impact of Imperceptible significance.

Table 13.15: Summary of Potential Operational Phase Impacts on water bodies within the Study Area

Water body Name	Project Operation	Potential Impacts			
		Description of Potential Impacts	Sensitivity of Receptor	Magnitude of Impacts	Significance of Impacts
Tolka_040	Runoff to surface water drainage	Increase in impermeable area within the catchment attenuated by SuDS	High	Negligible	Imperceptible Permanent Beneficial
Tolka_050	Runoff to surface water drainage	Increase in impermeable area within the catchment attenuated by SuDS	High	Negligible	Imperceptible Permanent Beneficial
Royal Canal Main Line (Liffey and Dublin Bay)	Runoff to surface water drainage	Increase in impermeable area within the catchment attenuated by SuDS	Very High	Negligible	Imperceptible Permanent Beneficial
Liffey Estuary Upper	Runoff to combined sewer	Increase in impermeable area within the catchment attenuated by SuDS	Very High	Negligible	Imperceptible Permanent Beneficial
Dublin Zoo Ponds	Runoff to surface water drainage	Increase in impermeable area within the catchment attenuated by SuDS	Medium	Negligible	Imperceptible Permanent Beneficial

13.4.6 Assessment of Potential Impacts – Traffic Redistribution

Traffic modelling (Chapter 6 (Traffic & Transport)) has been undertaken for two scenarios: Do Minimum and Do Something for 2028 and 2043. The review of changes in AADT provides a mechanism to understand if the

Proposed Scheme could result in traffic redistribution onto the surrounding local road network. A review of the data identified that, for most cases, any increases in traffic on side roads would not lead to AADTs being above 10,000. In eight sections of road, there would be an increase to above 10,000 AADT in 2028 and/or 2043. The AADTs for these sections are presented in Table 13.16.

Table 13.16: AADT where traffic flows have increased from <10,000 to >10,000 in DS 2028 and/or 2043

Road Name	A_B (GIS)	Length of Section (km)	2028 Do Min	2028 Do Something	%	2043 Do Min	2043 Do Something	%	Closest existing drainage route	Likely change in drainage catchment	Significant Impact
Ratoath Road	12214_ 12263	0.559	9856	10347	5	9891	10012	1	Tolka_050 or Royal Canal	Possible; may still be combined sewer	<10,500 AADT Small magnitude. Slight impact. Not significant
Hollywood Drath Road (R121)	28146– 28703	0.343	9853	10533	7	10480	10671	2	Powers-town (Dublin)_010	Yes. New water body	>10,500<11,000 AADT Medium magnitude Moderate impact. Not significant.
Damas-town Road/ Close Jn	28185_ 28187	0.02	9749	10648	9	9076	10261	13	Tolka_030	Yes. New water body	<100m Negligible magnitude. Imperceptible impact. Not significant.
Damas-town Road/ Close Jn	28186_ 28313	0.025	8834	12807	45	9346	13278	42	Tolka_030	Yes. New water body	<100m. Negligible magnitude. Imperceptible impact. Not significant.
Damas-town Road/ Close Jn	28187_ 28186	0.019	8372	11850	42	8798	12204	39	Tolka_030	Yes. New water body	<100m. Negligible magnitude. Imperceptible impact. Not significant.
Cappagh Road/M50 overbridge	28202_ 15196	0.598	9059	9703	7	9377	10132	8	Tolka_050	No	No
Damas-town Close/ Avenue Roundabout	28436_ 28498	0.042	8762	11047	26	9303	11651	25	Tolka_030	Yes. New water body	<100m Negligible magnitude. Imperceptible impact. Not significant.
Damas-town Close	28498_ 28187	0.495	7117	9606	35	7686	10280	34	Tolka_030	Yes. New water body	<10,500AADT. Small magnitude. Slight impact. Not significant.
Ballycoolin Road (Tolka_040 crossing)	28643_ 28768	0.425	8889	9923	12	9118	10300	13	Tolka_040	No	No
Portan Road	35877_ 35879	0.217	9346	10159	9	9445	10343	10	Tolka_030	Yes. New water body	<10,500 AADT. Small magnitude. Slight impact. Not significant

For all eight of these locations, the likely drainage catchment was identified; in all cases, these roads will drain to the same catchment as the section of the Proposed Scheme that they are closest to (i.e. the traffic may have moved, but the runoff receptor remains the same). As above, the receptor is anticipated to benefit from the

introduction of SuDS and minor treatment and/or attenuation. Based on the decision tree set out in Section 13.2.4.5 the potential impacts are not significant.

Overall, and based on the precautionary principle, the combination of traffic reduction on the main line, small scale treatment and/or attenuation and traffic displacement are anticipated to have an imperceptible impact on the receptor.

13.4.7 Summary of Flood Risk Assessment

13.4.7.1 Historic Flooding

The Proposed Scheme is largely on existing carriageways and results in minimal additional paved areas. Therefore, the Proposed Scheme does not increase the risk of these events reoccurring compared to the current scenario.

13.4.7.2 Coastal Flood Risk

The nearest distance of the Proposed Scheme to the coastal boundary, located at Liffey Quay, measures approximately 1km, and is elevated above sea level. There is therefore no risk of coastal flooding to the Proposed Scheme in the present, or future climate change scenario.

13.4.7.3 Groundwater Flood Risk

The Proposed Scheme does not involve significant changes in levels or basement construction. As the Proposed Scheme is on existing roads with no known flooding specifically due to groundwater, it is not expected that this risk will increase to the site or surrounding areas due to the construction of the Proposed Scheme. The risk of groundwater flooding to the site is therefore considered low.

13.4.7.4 Pluvial Flood Risk

The risk of pluvial flooding along the majority of the proposed route is high, however this risk exists in the current scenario and will be reduced as a result of the Proposed Scheme.

All new surface water sewers provided as part of the Proposed Scheme shall be designed so that no flooding will occur for a return period up to 30 years. This is an improvement when compared to some of the existing historical drainage infrastructure to be replaced and will reduce the risk of pluvial flooding. However, the drainage design is not proposing to replace existing drainage infrastructure. Only the new infrastructure will be size to restrict the flooding to 1 in 30 years. If the existing is flooding, it will likely remain flooding. Also, as part of the Proposed Scheme, new drainage infrastructure is being provided which includes new SuDS such as oversized pipes, filter drains, swales and attenuation ponds. These SuDS features provide some surface water storage and thus reduce the risk of pluvial flooding.

13.4.7.5 Fluvial Flood Risk

The proposed widening of the N3 to accommodate the Proposed Scheme requires the Tolka Bridge to be widened further at its southern end. It will be widened by approximately 2m; the abutments will be extended to suit and will not encroach in the floodplain. The soffit level will be 500mm above the existing soffit. As such the proposed bridge extension is not anticipated to have an impact on the Tolka flood flows and will not cause changes to flood risk.

13.4.7.6 Justification Test

The Proposed Scheme is categorised by the Planning System and Flood Risk Management Guidelines for Planning Authorities (DoEHLG and OPW, 2009) as a ‘highly vulnerable development’ and is required to pass the justification test if any part of the development is located within Flood Zone A or Flood Zone B. As the proposed

route from Blanchardstown to City Centre lies within Flood Zone C, are at low risk of flooding. As such, a 'Justification Test' is not required and the development is considered appropriate.

13.5 Mitigation and Monitoring Measures

13.5.1 Introduction

This section sets out the measures envisaged to avoid, prevent or reduce any significant adverse effects on the environment and, where appropriate, identify any proposed monitoring of the efficacy of implementing those mitigation measures. This section covers both the Construction and Operational Phases. Construction works will take place in accordance with Appendix A5.1 Construction Environmental Management Plan (CEMP), which is included as Appendix A5.1 in Volume 4 of this EIAR.

13.5.2 Construction Phase

13.5.2.1 Mitigation Measures

In terms of mitigation, a Surface Water Management Plan (SWMP) has been prepared (provided in the CEMP, Appendix A5.1 in Volume 4 of this EIAR), which details control and management measures for avoiding, preventing, or reducing any significant adverse impacts on the surface water environment during the Construction Phase of the Proposed Scheme. It will be a condition within the Employer's Requirements that the successful contractor(s), immediately following appointment, must detail in the SWMP how it is intended to effectively implement all the applicable measures identified in this EIAR and any additional measures required pursuant to conditions imposed by An Bord Pleanála to any grant of approval.

At a minimum, all of the control and management measures set out in the SWMP will be implemented. This includes measures relating to:

- Construction Compound management including the storage of fuels and materials;
- Control of Sediment;
- Use of Concrete;
- Management of vehicles and plant including refuelling and wheel wash facilities (if necessary); and
- Monitoring.

Following implementation of the general mitigation measures, the majority of impacts will be not significant. However, there are some construction activities at the following locations which will require additional site- specific measures:

- Construction Compounds;
- BR01 Tolka River Bridge widening; and
- BR02 Mill Road Bridge widening and RW07A and RW07B Pedestrian Ramps at Mill Road.

13.5.2.1.1 Construction Compounds

Construction Compound BL1 at Old Navan Road is in close proximity the Tolka_040. Whilst there is an existing line of trees which would act as a buffer and provide some protection to the water body from contaminated surface water runoff during the set up and operation of the compound, the close proximity presents a risk for potential impacts from storage of materials and runoff. Silt curtains/bunding or infiltration trenches will be installed by the appointed contractor on the northern boundary of Construction Compound BL1 to prevent any silty water or spillages from reaching the water body. The appointed contractor will store fuels as close as possible to the southern boundary of Construction Compound BL1, where an existing low wall will be retained and act as a bund to protect surface water drains in the Old Navan Road to the south. All other construction activities that could be

a potential risk to waterbodies or the storage of materials will similarly be located at the southern boundary of the site by the appointed contractor.

For compound BL2 at Junction 6 to the west of the M50, the existing wall will provide some measure of protection to any surface water connections within the car park; approximately 7m of this wall will be removed by the appointed contractor and approximately 20m replaced with a new retaining wall. To the north of the compound site, the surface water system will be protected through the use of filter drains or silt curtains by the appointed contractor at locations where there is potential for silty water runoff to those drains (the grassed area slopes towards the drains for a short distance). In addition, the surface water manhole in the grassed area will be clearly marked and protected by the appointed contractor from any possible contamination through the use of bunding or temporary sealing.

Construction Compounds BL3a and BL3b to the east of the M50, the only potential pathway to the Royal Canal is via surface water drains which may be present in the road which bisects the two sites. Surface water drains on the road will be identified clearly and bunded on the side of the compounds by the appointed contractor, allowing the road to still drain freely.

All other generic measures relating to the set up and management of construction compounds, the storage of soil, materials and fuel as set out in the SWMP will be implemented by the appointed contractor.

13.5.2.1.2 BR01 Tolka Bridge Extension

Considering the works to the lands directly adjacent to the banks of the Tolka_040, the following mitigation measures below, which are in line with IFI Guidelines on Protection of Fisheries During Construction Works Adjacent to Waters (2016) (IFI, 2016) on works adjacent to watercourses, will be implemented by the appointed contractor to minimise and avoid impacts:

- All necessary consents will be obtained from the relevant regulator (such as IFI, OPW or the local authority), as appropriate;
- Bank stabilisation and erosion protection, if required, will be designed in consultation with the IFI and NPWS;
- Operation of machinery in-stream will not be permitted. All construction machinery operating near to the water body will be mechanically sound to avoid leaks of oils, hydraulic fluid, etc.;
- The area of disturbance of the watercourse bed and bank will be the absolute minimum required;
- Reinstatement of any banks affected during construction works near a watercourse will be reinstated back to pre-development conditions;
- Any bank-side clearance in the immediate area of the crossing should be kept to a minimum and adequate measures should be put in place to control or minimize the risk of siltation. This may include such measures as:
    - Bunding and diversion of site runoff to settlement ponds
    - Stripping of topsoil. See Soils in A Guide to Landscape Treatments for National Road Schemes in Ireland (National Roads Authority, 2005), and where necessary, surfacing of site with granular materials; and,
    - Covering of temporary stockpiles.

Further details are provided in Chapter 5 (Construction), which states that sheet piling will be installed by the appointed contractor on the land side of the existing gabion baskets to protect the Tolka_040 from the construction works and to retain the existing bank during excavation works for the bridge foundations. The sheet piles will be driven and installed in accordance with Inland Fisheries Ireland (IFI) Guidelines on Protection of Fisheries During Construction Works Adjacent to Waters (IFI 2016). Environmental mitigation measures including silt curtains and silt busters will be installed within the temporary working area by the appointed contractor, to mitigate potential impacts associated with surface water runoff on the River Tolka.

13.5.2.1.3 BR02 Mill Road Bridge and RW07A and RW07B Pedestrian Ramps at Mill Road

The structures to the northern side of N3 Dual Carriageway and the temporary working areas are in close proximity to the Tolka_040 and so there is increased risk of silty water or concrete washings reaching the Tolka_040 across surfaces or via local surface water drains.

In order to avoid or minimise impacts, the appointed contractor will bund local surface water drains on the construction activity side and erect silt fences around the extent of the works to prevent accumulated silty water from leaving the site in the event of rainfall. All other generic measures relating to the storage of soil, materials and fuel as set out in the SWMP will be implemented by the appointed contractor.

13.5.3 Operational Phase

Mitigation for the Operational Phase has been built into the design of the Proposed Scheme. These are described in Section 13.4.1.1. No additional mitigation is required.

In the Operational Phase the infrastructure (including the maintenance regime for SuDS) will be carried out by the local authority and will be subject to their management procedures.

13.6 Residual Impacts

13.6.1 Construction Phase

Following implementation of the mitigation measures outlined in Section 13.5 and the SWMP, there are no significant impacts predicted on any of the receptors in this study area. See Table 13.17.

Table 13.17: Residual Impacts Construction Phase

Water body	Project Activity	Predicted Impacts		
		Description of Predicted Impacts	Significance of Impacts	Post mitigation Significance of Impacts
Tolka_040	Road widening of the N3 Dual Carriageway	Increased surface water runoff; Increased sediment in runoff; Anthropogenic sources (fuel etc.)	Moderate/Slight Short-term, Adverse	Imperceptible Short term Adverse
Tolka_040	Construction Compound BL1 Old Navan Road Car Park	Increased surface water runoff; Increased sediment in runoff; Anthropogenic sources (fuel etc.)	Profound Short to medium term, Adverse	Imperceptible Short term Adverse
Tolka_040	BR01 Tolka Bridge Extension	Silty water runoff Oil spills	Profound Short to medium term, Adverse	Imperceptible Short term Adverse
Tolka_040	RW07A and RW07B Pedestrian Ramps and BR02 Mill Road Bridge	Silty water runoff Concrete washings	Significant Short term Adverse	Imperceptible Short term Adverse
Tolka_050	Construction Compound BL2 at Junction 6 West of M50	Increased surface water runoff; Increased sediment in runoff; Anthropogenic sources (fuel etc.)	Moderate/Slight Short to medium term Adverse	Imperceptible Short term Adverse
Tolka_050	Construction Compound BL3a at R147 East of the M50	Increased surface water runoff; Increased sediment in runoff; Anthropogenic sources (fuel etc.)	Profound/Significant Short to medium term, Adverse	Imperceptible Short term Adverse

Water body	Project Activity	Predicted Impacts		
		Description of Predicted Impacts	Significance of Impacts	Post mitigation Significance of Impacts
Tolka_050	Construction Compound BL3b at R147 East of the M50	Increased surface water runoff; Increased sediment in runoff; Anthropogenic sources (fuel etc.)	Moderate/ slight Short-term Adverse	Imperceptible Short term Adverse
Tolka_050	Construction of new bus lane from M50 roundabout	Increased sediment in runoff	Moderate to Slight Short term Adverse	Imperceptible Short term Adverse
Royal Canal Main Line (Liffey and Dublin Bay)	Widening of Navan Road	Increased sediment in runoff	Significant to Moderate Short term Adverse	Imperceptible Short term Adverse
Liffey Estuary Upper	Road widening and junction improvements	Increased surface water runoff; Increased sediment in runoff; Anthropogenic sources (fuel etc.)	Imperceptible	Imperceptible Short term Adverse
Dublin Zoo Ponds	Road widening and junction improvements	Increased surface water runoff; Increased sediment in runoff; Anthropogenic sources (fuel etc.)	Moderate	Imperceptible Short term Adverse

13.6.2 Operational Phase

As no mitigation is required, residual impacts are as set out in Section 13.4.5. No significant impacts are anticipated for any other water body in the study area. See Table 13.18.

Table 13.18: Residual Impacts Operational Phase

Water body	Project Operation	Predicted Impacts		
		Description of Predicted Impacts	Significance of Impacts	Post Mitigation Significance
Tolka_040	Runoff to surface water drainage	Increase in impermeable area within the catchment attenuated and treated by SuDs	Imperceptible	Imperceptible
Royal Canal Main Line (Liffey and Dublin Bay)	Runoff to surface water drainage	Increase in impermeable area within the catchment attenuated and treated by SuDs	Imperceptible	Imperceptible
Liffey Estuary Upper	Runoff to combined sewer	Increase in impermeable area within the catchment attenuated and treated by SuDs	Imperceptible	Imperceptible
Dublin Zoo Ponds	Runoff to surface water drainage	Increase in impermeable area within the catchment attenuated and treated by SuDs	Imperceptible	Imperceptible

13.6.3 Summary of WFD Assessment

13.6.3.1 Assessment

Full details of the WFD Assessment can be found in Appendix A13.1 in Volume 4 of this EIAR. A summary is provided here for ease of reference.

Taking into consideration the anticipated impacts of the Proposed Scheme on the biological, physico-chemical and hydromorphological quality elements, following the implementation of design and mitigation measures, it is concluded that it will not compromise progress towards achieving Good Ecological Status (GES) or Good Ecological Potential (GEP) or cause a deterioration of the overall GES or GEP of any of the water bodies that are in scope (**Table 13.19**).

Table 13.19: Compliance of the Proposed Scheme with the Environmental Objectives of the WFD

Environmental Objective	Proposed Scheme	Compliance with the WFD Directive
No changes affecting high status sites	No water bodies identified as high status	Yes
No changes that will cause failure to meet surface water GES or GEP or result in a deterioration of surface water GES or GEP	After consideration as part of the detailed compliance assessment, the Proposed Scheme will not cause deterioration in the status of the water bodies during construction following the implementation of mitigation measures; during operation, no significant impacts are predicted.	Yes
No changes which will permanently prevent or compromise the Environmental Objectives being met in other water bodies	The Proposed Scheme will not cause a permanent exclusion or compromise achieving the WFD objectives in any other bodies of water within the River Basin District.	Yes
No changes that will cause failure to meet good groundwater status or result in a deterioration groundwater status.	The Proposed Scheme will not cause deterioration in the status of the of the groundwater bodies.	Yes

The WFD also requires consideration of how a new scheme might impact on other water bodies and other EU legislation. This is covered in Articles 4.8 and 4.9 of the WFD.

Article 4.8 states: '*a Member State shall ensure that the application does not permanently exclude or compromise the achievement of the objectives of this Directive in other bodies of water within the same river basin district and is consistent with the implementation of other Community environmental legislation*'.

All water bodies within the study area have been assessed for direct impacts and indirect impacts. The assessment concludes that the Proposed Scheme will not compromise the achievement of the objectives of the WFD for any water body. In addition, the Proposed Scheme has been assessed for the potential for cumulative impacts with other Proposed Developments within 1km of the study area. This concludes that in combination with other Proposed Developments the Proposed Scheme will not compromise the achievement of the objectives of the WFD for any water body. Therefore, the Proposed Scheme complies with Article 4.8.

Article 4.9 of the WFD requires that "Member States shall ensure that the application of the new provisions guarantees at least the same level of protection as the existing Community legislation".

The Habitats Directive (1992) promotes the maintenance of biodiversity by requiring Member States to take measures to maintain or restore natural habitats and wild species listed on the Annexes to the Directive at a favourable conservation status, introducing robust protection for those habitats and species of European importance. There are European designated sites in the vicinity of the Proposed Scheme which have been assessed and are presented in an Appropriate Assessment Screening report and Natura Impact Statement (NIS) submitted with the application.

The Nitrates Directive (1991) aims to protect water quality by preventing nitrates from agricultural sources polluting ground and surface waters and by promoting the use of good farming practices. The Proposed Scheme will not influence or moderate agricultural land use or land management.

The revised Bathing Water Directive (rBWD) (2006/7/EC) was adopted in 2006, updating the microbiological and physico-chemical standards set by the original Bathing Water Directive (BWD) (76/160/EEC) and the process used to measure/monitor water quality at identified bathing waters. The rBWD focuses on fewer microbiological indicators, whilst setting higher standards, compared to those of the BWD. Bathing waters under the rBWD are classified as excellent, good, sufficient or poor according to the levels of certain types of bacteria (intestinal enterococci and Escherichia coli) in samples obtained during the bathing season (May to September). The

Proposed Scheme will not impact any designated bathing waters as there are none less than 2km from the Proposed Scheme. It is therefore compliant with the revised Bathing Water Directive.

13.6.3.2 Conclusion

Considering all requirements for compliance with the WFD, the Proposed Scheme will not cause a deterioration in status in any water body, not prevent it from achieving GES or GEP; there are no cumulative impacts with other Schemes; and it complies with other environmental legislation.

It can be concluded that the Proposed Scheme complies with all requirements of the WFD.

Taking into consideration the impacts of the Proposed Scheme on the biological, physico-chemical and hydromorphological quality elements, it is concluded that following the implementation of design and mitigation measures, it is concluded that it will not compromise progress towards achieving GES or GEP or cause a deterioration of the overall status of the water bodies that are in scope; it will not compromise the qualifying features of protected areas and is compliant with other relevant Directives. It can therefore be concluded that the Proposed Scheme is fully complaint with WFD and therefore does not require assessment under Article 4.7 of the WFD (see Appendix A13.1 in Volume 4 of this EIAR for more details).

13.7 References

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